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*A National Newspaper for Every Branch of the Industry*

# Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · MACHINERY · PARTS · ACCESSORIES · TOOLS

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First Copy

## Battery Makers' Group Adopts Trade Practice Rules; to Meet in Fall

### Two-Day Session at Louisville Makes Real Advance Toward Ending Confusing Activities Within The Battery Industry Itself

Louisville, Ky., May 4.—At adjournment of the spring meeting of the National Battery Manufacturers' Association, Tuesday, to enable members to attend the races at Churchill Downs, the feeling was expressed that the organization had accomplished a great deal in the two days sessions toward unity in the battery industry. E. D. Martin, president of the body, remarked that the program had been run off without a hitch, that the attendance of nearly one hundred was quite satisfactory, and that there was unity and co-operation of thought and action throughout.

It was decided that the fall meeting would be held in Chicago, during the last weeks of the Century of Pregross Exposition, the exact days to be set later. Washington, Cleveland and other cities had asked for the fall meeting, but it was figured that many members would enjoy the opportunity of combining a business meeting with attending the so-called World's Fair. The meeting will be in November.

On Monday morning, ahead of the

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## M. E. W. A. OFFICIAL CATALOG PUBLISHED

**Chicago, May 4.—The M. E. W. A. official catalogue of approximately 1,000 pages has just been issued, and is being mailed to both members and non-members of the Motor and Equipment Wholesalers Association, it was announced here today by B. W. Ruark, general manager.**

B. W. Ruark

Unique in a number of respects as a catalogue production, the new volume was compiled, printed and bound by the Catalogue Association, 431 South Dearborn St., Chicago. It is divided into 810 sections, each devoted to a specific type of automotive item.

The new catalogue is bound in brown leather, with gold letters, for use by the jobbers' customers, and is also furnished without a cover when intended for jobber salesmen who have their own binders, into which it fits.

A novel feature is the method of indexing by sections, and since the catalogue is in loose-leaf form, the

(Continued on Page 2)

## BORG-WARNER PLANS NOVEL EXHIBIT AT FAIR

**Chicago, May 4.—An illuminated glass-panel automobile is one of the most novel displays by automotive parts manufacturers at the Chicago Century of Progress Exposition. The car is featured in the display space of the Borg-Warner Corporation in the Travel and Transport Building**

The outline of a very modern automobile of actual size is etched on a series of glass panels giving the appearance of a real motor car made of glass. Within the car are shown the actual radiator, timing chain, carburetor, clutch, free-wheeling unit, universal joint, fly-

(Continued on Page 2)

## STUDEBAKER APRIL CAR EXPORTS SET 37-MONTH RECORD

**South Bend, Ind.,** May 4.—April exports of Studebaker, Rockne and Pierce-Arrow passenger cars were the largest for any month since March, 1930, and truck exports were the largest since September, 1931, it was announced here today by Arvid L. Frank, vice-president and general manager of the Studebaker Pierce-Arrow Export Corporation.

A. L. Frank

"In addition to establishing a new record for thirty-seven months, our April car exports were 25 per cent. ahead of April, 1932.

"The nineteen-month truck record includes exports of all commercial units of Studebaker and White manufacture — Studebaker trucks,

(Continued on Page 2)

## ADAMS APPOINTED A. S. A. GEN. MANAGER

**New York ,May 4. — Richard J. Adams has just been appointed general manager and executive secretary of the Automotive Service Association to serve for an indefinite period. Mr. Adams assumes his new duties at once.**

Bringing with him much valuable information as a result of close contact with the A. S. A. for the past five years, Mr. Adams is well suited to fill his new position, and has entered into his work with the vim and enthusiasm so well known to those with whom he has been associated.

Mr. Adams is editor of the A. S. A. official publication, The Service Bulletin. He has capably carried on his duties of governing the editorial policy of that publication for the past five years. In addition, he has acted as treasurer of the A. S. A. since July 1, 1929, by virtue of which office he has served on the board of directors. He will continue to serve the association in the above capacities.

Hsi automobile career dates back some sixteen years, twelve of which were spent with the Buick and export divisions of the General Motors Corporation in sales and service executive capacities. The announcement was made through John F. Creamer of Wheels, Inc., president of the association.

# *N.A.C.C. Members During April Produced 137,000 Vehicle Units*

### Largest Output in Twenty-one Months by Chamber Companies Encourages Industry; May Bring Total For Industry Above A.D.N. Estimate of 168,000

New York, May 4.—The National Automobile Chamber of Commerce today announced production figures covering its members' operations during April, 1933, a total of 137,300 vehicle units, the highest output achieved in twenty-one months. This represents a gain of 62 per cent. over March this year and an increase of 3 per cent. over April, 1932. This output exceeded every monthly total for N. A. C. C., members since July, 1931.

This leaves only the production of the Ford Motor Company to be accounted for and there is every indication that the total output for April exceeded by some thousands of units the estimate of 168,000, which Automotive Daily News presented last week. With these definite N. A. C. C. figures in hand a conservative estimate of the grand total would place the figure in the neighborhood of 175,000 vehicle units.

In connection with these April production returns it is interesting to note the estimate which appeared recently in Automotive Daily News on probable output for the month of May, placing the figure at better than 200,000 and indicating 210,000 as the probable level. On the basis of April returns, it looks as if the May output would exceed our estimate. In May, 1932, the total output of the industry was 192,519 vehicle units.

## McKINNEY HEADS PACKARD SALES AND ADVERTISING

F. H. M'KINNEY

**Detroit, May 4.—F. H. McKinney, advertising manager of the Packard Motor Car Company, has been ap-**

(Continued on Page 6)

## DODGE AND PLYMOUTH IN RETAIL DELIVERIES SHOW SHARP INCREASE

**Detroit, May 4.—For the week ended April 29 Dodge dealers' retail deliveries of Dodge and Plymouth passenger cars made another sharp advance by proving to be 24.1 per cent. higher than they were in the preceding week.**

The business in Dodge commercial cars and trucks took a sensational spurt of its own, being 70.7 per cent. higher than the preceding week's truck deliveries.

Stated in figures, the week's deliveries made by Dodge dealers amounted to 1,778 Dodge passenger cars, 1,407 Plymouths and 321 Dodge trucks. April deliveries of Dodges alone were 6,894 units.

Not only is the week ended April 29 the twenty-third week of the present season to show sales in-

(Continued on Page 6)

## STEEL RATE RISES 1% AT YOUNGSTOWN

**Youngstown, May 4.—Steel mill operations in the Youngstown district advanced 1 point at mid-week to 33 per cent. of capacity.**

Steel producers and consumers throughout the country report growing activity. Operations here a year ago were 26 per cent.

Thirty-two of eighty-three open-hearth furances are melting in the Youngstown district against 29 per cent. a week ago and fourteen in late March, while three of four Bessemer plants are operating.

Youngstown Sheet & Tube Company, accounting for the latest gain, is operating at 23 per cent. of

(Continued on Page 4)

## MILWAUKEE SALES UP SHARPLY; USED CAR STOCKS LOW

**Milwaukee, Wis., May 4.—Sales of automobiles in Milwaukee rose sharply during April, continuing an upturn which got under way the last two weeks of March. Enthusiasm was expressed by local distributors over the results of the month, and predictions made that May would be better than April. Demand continues for cars in the lower priced class, but increasing attention to the higher priced makes and models was also reported.**

Used car sales were brisk during April, some dealers stating that they have encountered a shortage in this type of merchandise, especially in the $150 to $200 range.

Final statistics on new car sales in Milwaukee county have not yet been compiled, but Palmer Hanson, secretary of the Milwaukee Automotive Trades, said April this year will compare favorably with the same month last year and far ahead of March. This means April sales will be somewhat better than the 856 cars sold in Milwaukee county in April, 1932. Sales in March came

(Continued on Page 3)

## FARM-TO-MARKET TRUCKING INCREASES

**Washington, D. C., May 4.—Motor-trucked receipts of fruits and vegetables in eight markets last year—Boston, New York, Philadelphia, Kansas City, Denver, Salt Lake City, San Francisco and Los Angeles—were equivalent to 158,000 carloads, as against 136,000 carloads in 1931, according to the Bureau of Agricultural Economics of the Department of Agriculture.**

The truck-carried deliveries of 1932 were about 37 per cent. of the unloads of rail, boat and truck shipments combined, in comparison to 31 per cent. in 1931. According to the bureau, there is also some movement by truck direct to retailers and consumers for which reports are not available, in addition to reported truck receipts at central markets.

Motor truck deliveries of farm products in Philadelphia in 1932 were equivalent to about 30,000 cars, as against 42,000 cars hauled by rail and boat. In New York city, truck unloads of 53,000 cars amounted to about 26 per cent. of the domestic supply. In Boston they amounted to about 23 per cent., while Los Angeles hit the high mark of 77 per cent.

About 41 per cent. of the 1932 potato crop of the intermediate and late crop states which was marketed up to January 1 of this year was

(Continued on Page 3)

## DIAMOND T REPORTS APRIL SALES AS BEST IN OVER THREE YEARS

**Chicago, May 4.—April sales of the Diamond T Motor Car Company, Chicago manufacturer of motor trucks, showed an increase of 41 per cent. over the same period of last year and were higher than any month since 1930, according to an announcement made here today by E. J. Bush, sales manager. This record-breaking month continues the exact rate of Diamond T sales increases of the first quarter, which was also 41 per cent. ahead of last year.**

During April a fleet of thirty-seven trucks were sold to R. H. Macy & Company, New York, Mr. Bush stated, and other numerous fleet sales included orders from Sears Roebuck Company, Atlas Brewing Company, The Pie Bakers of America and The Liquid Carbonic Company.

An excellent volume of export sales of Diamond T trucks was also reported.

## NEW CAR SALES UP IN DAYTON SECTION

**Dayton, O., May 4.—Montgomery county, O., sales for April, 1933, of new passenger cars, 401; trucks, 27, compared to 301 sales of passenger cars and trucks combined for April, 1932.**

April, 1933, passenger car sales, according to make: Auburn, 6; Buick, 8; Chevrolet, 161; Cadillac, 3; Dodge, 15; De Vaux, 10; De Soto, 4; Essex, 3; Continental, 1; Chrysler, 10; Franklin, 0; Ford, 86; Graham, 6; Hudson, 1; Lincoln, 0; La Salle, 1; Oldsmobole, 12; Pontiac, 31; Packard, 1; Plymouth, 45; Studebaker, 1; Reo, 1; Rockne, 1; Willys, 4.

## BORG-WARNER PLANS NOVEL EXHIBIT AT FAIR

(Continued from Page 1)

wheel starter gear, transmission, steel artillery-type wheel and the new automatic oil control, all parts made by Borg-Warner subsidiariary companies.

Unusual lighting effects seem to change the color of the automobile continually while a voice relates a description of the significance of each of these products.

Surrounding the glass-panel automobile and directly connected with it are the individual exhibits of each of these automotive parts in which their principals of operation are graphically explained.

Another distinct feature of the Borg-Warner display is the huge illuminated fountain of motion which is located in the entrance foyer of the exhibit.

The fountain offers a fantastic representation of precision automotive parts. Twenty-four different mechanical movements are uniquely displayed in operation upon three large fins which revolve amidst a shower of ever changing colored lights.

### MOTOR MAN NAMED GRAND RAPIDS MANAGER

**Grand Rapids, Mich., May 4.**—Ernest T. Conlon, first secretary and manager of the Grand Rapids Automobile Dealers Association and first promoter of automobile shows in this vicinity, has been appointed city manager of Grand Rapids. He is manager of the western Michigan branch of the American Automobile Association and founder of the Grand Rapids Motor Club.

### NEW WORTHINGTON OFFICE

**Harrison, N. J., May 4.**—The new office building of the Worthington Pump and Machinery Corporation, situated adjacent to the corporation's plant here, was opened May 1. The general and executive offices, formerly situated at 2 Park Ave., New York, have been moved to the new location for better co-ordination with manufacturing and sales operations. The local sales office will be continued at 2 Park Ave.

## CANADIAN EXPORTS OF CARS, PARTS INCREASE

**Washington, May 4.** — March exports of motor vehicles and parts from Canada showed an increase over February of 233 per cent. and of 221 per cent. over March, 1932, shipments, according to Commerce Department. March exports were valued at $823,842, compared with $247,418 in February. The increase was entirely in passenger cars and parts. Truck exports were materially smaller.

## DE SOTO SALES UP 25% IN WEEK OF APRIL 29

**Detroit, May 4. — For the week ended April 29, the sales by De Soto's national dealer organization totaled 1,760 vehicle units, an increase of 25.3 per cent. over that of the previous week. This is the best week enjoyed by De Soto dealers since June of last year.**

Production has had to be stepped up at the De Soto plant to meet this demand. Reports from dealers in many sections indicate that May business is going to show a very satisfactory increase. It is quite probable that sales records will be broken during the coming sales bulge. Executives report a remarkable growth of optimism in the national dealer organization, with a general feeling that business is at last definitely on the upward swing.

## M. E. W. A. OFFICIAL CATALOG PUBLISHED

(Continued from Page 1)

jobber can keep it up to date so far as the particular brand of merchandise is concerned. Changes, when made, do not interfere with the indexing system.

The catalogue is complete in contents, with revisions and changes in products and prices included up to April 10.


# MAY TRUCK ISSUE

*Brewers, Contractors and Owners of Over 1,000,000 Business Vehicles Will Get This Issue*

| *Revised schedule of Truck Issues* |
|---|
| MAY 13 |
| JUNE 17 |
| JULY 15 |
| AUG. 5 and AUG. 26 |
| SEPT. 16 |
| OCT. 14 |
| NOV. 11 |
| DEC. 16 |

Personally addressed copies to the Machol list, comprising over 20,000 names.

If you want to reach not only those owners but exclusive truck dealers, important bus operators, leading passenger car dealers and important factory officials, use that issue with a page at $350; half page at $175, or a quarter page at $87.50.

Forms close 2 days preceding publication.

**Automotive Daily News**

H. A. TARANTOUS, *Bus. Mgr.*, 350 HUDSON STREET, N. Y. C.

DETROIT OFFICE: Geo. M. Slocum, *Manager* Fisher Building, Detroit, Mich.

WESTERN OFFICE: Willard R. Cotton, *Manager* 333 No. Michigan Ave., Chicago, Ill.


## FINANCIAL NEWS

### OWENS-ILLINOIS

**Toledo, May 4.**—Owens-Illinois Glass Company has signed contracts for the purchase of the entire assets and business of the Hemingray Glass Company of Muncie, Ind., manufacturers of glass insulators, and substantially all of the essets of the O'Neill Machine Company of Toledo, O., manufacturers of glass bottle-blowing machines of the vacuum type, it was announced last night by William E. Levis, president of Owens-Illinois.

### SCRAP PRICES

**Chicago, May 4.**—An advance of 50 cents a ton in scrap steel prices at Chicago was followed yesterday by reports that negotiations are in progress for sales of a large tonnage of the heavy melting grade in the Pittsburgh area at $12.50 a ton, or 50 cents above the $12 sale made on Tuesday, in which the buyer was the United States Steel Corporation. The highest actual price paid for the top grade of scrap during the current movement was $12.05 a ton on material sold by the Boston & Ohio Railroad to a steel mill in West Virginia. The market at Pittsburgh is bare of stock and very strong, according to news reports. The depression low for scrap steel at Pittsburgh was around $9 a ton.

The 50-cent advance on scrap at Chicago was established on the sale of a few tons to the Youngstown Sheet and Tube Company at $8.50 a ton.

### ELECTRIC OUTPUT

**New York, May 4.**—Production of electricity by electric light and power companies in the United States totaled 1,427,960,000 kilowatt hours in the week ended April 18, compared with 1,454,505,000 kilowatt hours in the corresponding week last year, a decline of 1.8 per cent., according to Edison Electric Institute. Output in the preceding week this year totaled 1,431,095,000 kilowatt hours, a drop of 2.6 per cent. from the 1932 period.

The report for the week was much the best in many months in comparison with the same week of the preceding year. Output along the Atlantic seaboard actually improved, amounting to 0.5 per cent. over last year. This was principally accounted for by a rise of 2.5 per cent for New England. Both the same larger and smaller divisions showed increases in the preceding week, but of smaller proportions.

### MARLIN-ROCKWELL

**New York, May 4.**—Marlin-Rockwell and subsidiaries report for the quarter ended March 31 net loss of $53,796 after depreciation, charges, etc., comparing with net loss of $2,270 in the first quarter of 1932.

### PENNSYLVANIA RUBBER

**Jeanette, Pa., May 4.** — Pennsylvania Rubber passed the dividend on the 6 per cent. first prefered stock now due. It paid $1.50 December 31.

### GOODRICH

**Akron, May 4.**—Waddill Catchings was the only retiring director of the B. F. Goodrich Company not re-elected at the annual meeting, it was announced yesterday. J. J. Newman, assistant to the president, was elected a vice-president.

## STUDEBAKER APRIL CAR EXPORTS SET 37-MONTH RECORD

(Continued from Page 1)

Rockne delivery cars, White trucks and buses and Indiana trucks and buses. Both Studebaker and Indiana shipments in April set a new high record for the year," he stated. "Our truck exports to date are 41 per cent. ahead of the same four-month period in 1932.

"One feature of our April business that is highly gratifying to us is the fact that we were able to fill only orders that were received prior to the time that foreign currencies started their sensational upward journeys," he concluded. "With the added impetus to business that may be expected as a result of improved foreign purchasing power, both our passenger and truck shipments should show still further improvement in subsequent months."

## SPARKS *from* DETROIT

President Slocum

* * *

Driving Demonstration

* * *

Rockelman to Rest

* * *

Imagine That

* * *

*Chris Sinsabaugh*

*Detroit Editor*

DETROIT ADCRAFTERS have a new president and the club being so thoroughly identified with the automobile industry it is not surprising that the man who is donning the toga of John Gaughen of the Capper farm papers is none other than George M. Slocum fairly reeking with the gasoline odor because of his long connection with this great business of ours.

It is with pardonable pride that Automotive Daily News records the results of the election because the new incumbent is Detroit manager of Macfadden Publication, which owns A. D. N. and also publishes a string of national magazines, including Liberty. Slocum has been identified with Automotive Daily News since its inception seven years ago.

* * *

SLOCUM COMES UP from the ranks, as it were, having been an Adcrafter since 1908. He's been secretary, treasurer and director off and on ever since. He's not the first automobile man to sit in the presidential chair, for among his predecessors have been Henry T. Ewald, founder of the club, which is the oldest in the country; Lee Anderson, Fred Dickinson, Charles C. Winningham, E. LeRoy Pelletier and Charles Brook. He follows a man, John Gaughen, who in the two years he held down the job, accomplished wonders in the way of making the Detroit Adcraft Club probably the most famous of its kind in the country.

* * *

THE SLOCUM ADMINISTRATION also includes Walter Boynton, who was the first conductor of this column and now with Campbell-Ewald, first vice-president; Leo Fitzpatrick, manager of WJR radio station, second vice-president; Gordon K. MacEdward, Animated Advertising Displays, treasurer, and Edwin W. Husen, president E. W. Husen, secretary.

Directors are John Gaughen, Capper Publications; Herbert Ponting, Detroit News; Verne Tucker, Campbell-Ewald; J. J. Hartigan, Campbell-Ewald; C. W. Hungerford, Michigan Bell Telephone; Tom Wade, Curtis Publishing Company. Harold Hastings continues as secretary-manager.

* * *

HERE'S SOMETHING for the book and it has to do with making one hand wash the other, killing two birds with one stone or what have you. I picked it up at the Hudson factory when I ran into Oscar Brown, Hudson-Essex dealer at Asheville, N. C. Brown was there convoying the sheriff of the county in which Asheville is located; a road commissioner, the county clerk and the secretary of the board of commerce of the town. They are driving five Terraplanes back.

But that isn't all of the story. This Brown must be a convincing talker, for his fellow townsmen were prospects. They hadn't bought their cars, but had made the long trip for the purpose of driving them home in the way of a demonstration. But it is dollars to doughnuts they will buy, for this is the fifth trip Brown has made, each time with prospects who took their demonstrations by participating in the driveaways. And the records show that twenty out of twenty-one have bought cars at the finish is a result.

* * *

"IT'S ME FOR ATLANTIC CITY for a couple of weeks and then most likely I will make a European trip," says Fred Rockelman, who has just resigned as vice-president of Continental. "I've been in harness so long I feel I can take an extended vacation. I was in Russia for Ford several years ago and I want to look around again."

* * *

IMAGINE A STATE OFFICIAL espousing the cause of the motorist and fighting for substantial reductions in automobile license fees! There is such a man and he is Frank D. Fitzgerald, Michigan's secretary of state, who goes on record thusly:

"This Legislature should do something about lowering rates to make it possible for the poor man who owns an automobile to use it. Every agency of government seems to be concerning itself with relieving property of taxation burdens and devising new schemes to spread the cost, yet nobody is worrying about the excessive load the 1,000,000 or more Michigan motorists are forced to carry. It is time the automobile owner is given a break."

# Retail Salesmen — This Is Your Page

**This department is devoted to the interests of the retail sales division of the industry. Salesmen, this is your department. Automotive Daily News wants you to get something from this department that will help you in your work on the firing line. It wants you to pass on your own experiences, success, failures to help your brother salesmen. Send in your story in the form of a letter, or even a postal card, and let us get it ready for publication. Your achievement or your mistake may help another salesman to make sales or avoid errors that cost you commissions.**

**Dealers read this page. Give us the benefit of your reactions on these problems that affect the work of your salesmen, the men on the firing line, the men who bring home the bacon or don't.**

## PERPETUAL PROSPECT LIST IN CARD INDEX SYSTEM

*By ROBERT H. BROWN*

Just as regular as a newspaper is printed or the hands of clocks turn around, the Stout Motor Company of Birmingham is constantly adding new prospects to a modern index card system of prospects. Each salesman is required to spend a part of his time keeping this prospect list up to date and with new names of prospective Reo owners.

"We keep a minimum of 150 names in this card index system at all times. In this way we never run out of prospects and always have enough names for salesmen to work with successfully," said George Stout, manager of the company.

The names of prospects are obtained from a number of sources around Birmingham. Since this company sells a higher price car just any and everybody is not a prospect. They must be outstanding people with a steady and reliable income, of sufficient means of maintaining the operation of a large car.

The registration books at the courthouse offer a wealth of good names, according to Mr. Stout, but one of the better means of obtaining names is from the civic and social clubs around town. Nearly every outstanding citizen of a town belongs to some club such as Kiwanis, Elks, Masons, or some other club. Their membership stamps them as leading citizens who think enough of club life to pay a reasonable membership fee every year just for the privilege of being a clubman.

Names of these clubmen are obtained and placed in the lists of prospects. They are among the prize prospects obtained by Mr. Stout's organization.

"Each day each salesman has as his duty to take out about five names from the file as his day's call list. He starts out in the morning and calls on one or two of them —or all—depending on how much time he has. If he makes a sale well and good. Then at noon he usually returns to the office for a little work in the office," Mr. Stout explained.

This noon time work consists mostly of routine matters. He probably makes an appointment or two over the phone for that afternoon or the next morning. Then he turns his attention toward adding new names to the perpetual prospect file.

If in his calls that morning he has made a sale, he strikes off the list that name. If he has not made a sale, he reports the developments, if any, and refiles the card. Then if the prospect is dead the card is taken off the file and a new one added.

"If one is taken out, one is put in," is the way Mr. Stout explained it in a few words.

This file is used also for mailing purposes. As names are added, they are sent to Reo headquarters, where advertising literature is sent direct to the prospect. Each salesman is allowed around 150 names at a time, and each piece of literature carries the individual name of the salesman.

## OUR LEADING DEALERS

### *And How They Got That Way*

**A series of brief biographies of outstanding motor car and truck merchants.**

### *Q. H. BALL*

*Oldsmobile and Packard dealer in Troy, N. Y.*

Everybody in northeastern New York state knows Mr. Ball, who distributes Oldsmobiles and Packards to the citizens of Troy, N. Y., and vicinity. They should know him because he not only is prominent in automotive circles today, but he can boast of being a real pioneer in the field. He graduated from selling bicycles to distributing steam cars and that takes any automotive worker back into the dawn era of the industry.

Q. H. BALL

Mr. Ball was born in Charlotte, Ia. At the age of 18, flying in the face of Horace Greeley's advice, he came East. At 21 he was selling bicycles with his brother in Patterson, N. J. He worked for several manufacturers of steam cars and for a company retailing Royal Tourists, Locomobile and Curved-Dash Oldsmobiles.

In his steam car connection he participated in the building of Helen Gould's first automobile, and finally became Newark, N, J., branch manager for a then prominent car manufacturer.

In 1919 Mr. Ball was appointed the Troy, N. Y., dealer for the same company.

In May, 1925, he accepted the Packard and Oldsmobile dealership for Troy and vicinity, and from that time to the present he has done one of the most outstanding jobs accomplished in eastern New York for the automobile industry.

During his dealer's career in Troy, Mr. Ball has been president of the Troy Used Car Sales Corporation, president of the Troy Automobile Dealers' Association, director of the Troy Automobile Club, director, vice-president and now president of the Empire State Automobile Merchants' Association, Inc., to which office he was elected at their annual convention held in Niagara Falls, October 5, 1932 .

The friends of Mr. Ball attribute his success to his business ability, friendliness, honesty and integrity and to his being one of the hardest workers in our industry today. He even managed to make his competitors his dearest friends.

## MILWAUKEE SALES UP SHARPLY; USED CAR STOCKS LOW

(Continued from Page 1)

to 467 units, against 671 in March last year.

Chevrolet sales in Milwaukee county mounted about 75 per cent. during April over those of both the preceding month and the same month last year, and May will show large gains over April, according to F. A. Utecht, city sales manager. During March, an increase of 182 per cent. over the same month last year was reported. Unit sales in Milwaukee county for April are expected to run to about 200.

W. R. Simon, manager of the Milwaukee Ford plant, stated that sales through the plant, now a distribution and service point, will be approximately 800 units for April, or about 300 more than sold during March.

Incomplete figures show sales of the Edwards Motor Company, distributor of Dodge and Plymouth cars, were better in April than a year ago, and far above the March total. During April the company delivered more than 224 units, compared with 159 in April, 1932, and 149 in March this year, according to George R. Lindblom, general manager. For the frist four months of this year deliveries totaled 623, against 438 the same 1932 period. The new Plymouth lines were well received, Plymouths accounting for 40 per cent. of the April business.

"Another favorable indication is that there is a much larger percentage of cash business," said Mr. Lindblom. "Also, our servicing activities have been given a substantial boost." Large repair jobs are coming in greater volume than in over a year, according to Mr. Lindblom. A force of seventy-five mechanics was kept busy throughout the month.

April business was very good, according to A. W. Marcy, vice-president, Studebaker-Rockne Sales, Inc. Wholesale sales for April came to 35 and retail 15, or 50 in all, with April four times as good as March, Mr. Marcy said.

J. R. Histed, president of the Histed Motor Company, distributor, Chrysler and Plymouth, said business at present is better than at any time this year. Histed deliveries increased 25 per cent. during April over March and were only 5 per cent. below April last year. Deliveries during March this year were 20 per cent. above those of the same 1932 month.

Although the first two weeks of April were somewhat slow for the Braemer Sales Corporation, distributor of Hudsons and Essexes, the month finished up stronger than March did, according to W. A. Sullivan, general manager. The pick-up the last ten days was very pronounced, he stated.

April sales of Buick-Olds-Pontiac Sales Company were at least 50 per cent. above those of March, according to L. H. Kurtz, general manager, and were at about the same level as a year ago. Mr. Kurtz reported a substantial pick-up in sales of the higher priced units, stating Buick business in April was double that of March.

R. E. Widrig of Widrig Motors, Inc., Reo agency, said business of his firm last week was as good as it has ever been since he started in business here in the fall of 1929. Sales during April held steady with March and a year ago, with business increasing in the used car department, it was stated at the office of the Packard Milwaukee Motor Car Company.

## An Inquiring Reporter Visits Some Leading Car Dealers

Automotive Daily News has had an inquiring reporter on the job, talking to dealers. The inquiring reporter asked a number of leading automotive merchants whether there was anything the factories could do right now to stimulate retail buying. He also asked how business for May looks at the moment. Here are some of the answers he got.

Today our inquiring reporter asked the *London Motor Company in Fort Smith, Ark.*, what it considered the biggest thing a factory could do right now to help its dealers. Here is what this dealership replied: "Assistance both in sales and in organizing the territory for sub-dealer outlets." On the outlook for this month the London organization says: "Good; in fact, better than during the past year."

Then the reporter hopped over to San Antonio, Tex., and interviewed *Messrs. Birdson & Potchernick* on North Alamo Street. They had some very pertinent thoughts on how the factory can help the dealer, and here they are:

"There must be some action to help the dealer cure the used car trade-in evil. The dealer can no longer handle this alone and make sales. Either a junking allowance by the factory or a higher list, with longer discount, to permit some profit to be left for the dealer after making a deal involving a long trade-in. Sales cannot be made without the trade-in. Some method must be found to make the deal and still leave a margin for the dealer. Without a margin of profit the dealer cannot function much longer. One reason for the lack of sales today is that the dealer who is trying to operate and make a profit finds that under present conditions he cannot makes sales except upon an unprofitable basis. As stated, this cannot last always and the dealer cannot cure it alone.

"Dealers cannot or will not continue much longer to make sales for themselves or for the factories upon the present basis, which is at a loss. This loss today is being taken on all lines. The fact that every deal involves the purchase by the dealer of an old car before he can even think of closing a deal for a new car, and this in turn under present sales contracts and conditions means a loss to the dealer, is your answer to present poor sales records, even more than the depressed condition of the country generally. It will get worse instead of better, regardless of general prosperity, unless the whole selling and contract arrangement is radically changed." There is something to think over.

*Messrs. Birdson & Potchernick* now tell us what they think of May prospects: "General outlook and disposition of the public seem better. Actual conditions do not justify us in expecting too much. We are learning to get along and operate on less and hope eventually to again show a profit."

The next stop was Jackson, Miss., where our reporter interviewed *J. D. Sellers, vice-president of the Sellers Motor Company*, who had a bit of advice for the factories, as follows: "More co-operation, and don't shove factory losses off on the dealer. More discount to handle used cars."

Mr. Sellers has some hopeful words and an "if" on May prospects: "Good, if the banks open. Seventy-five per cent. of our deposits are in the two banks that are still closed."

All aboard again, and this time stopping at Topeka, Kan., for a visit at the headquarters of the *Wood Motors Corporation* on 6th Avenue. This company holds that the factories should "permit a trading allowance or give a greater junking credit." On May business the dealership is short, but encouraging, saying simply: "Better."

## FARM-TO-MARKET TRUCKING INCREASES

(Continued from Page 1)

hauled to consuming markets by motor truck, it is estimated. Trucks were also used to market 84 per cent. of the cantaloupe shipments and 77 per cent. of the strawberry shipments in Delaware and the Eastern Shore section of Maryland and Virginia. Added to these figures must also be the large redistribution by trucks operating out of large markets to surrounding territory.

Bureau figures show that considerable quantities of fruits and some vegetables are trucked 500 or more miles to market, but that most of the truck movement is within a radius of 100 to 150 miles. Thus last year 89 per cent. of New York city truck receipts came from New York and adjacent states and 90 per cent. of the Philadelphia receipts came from Pennsylvania and adjacent states.

### REVERE COPPER

**Boston,** May 4.—Revere Copper and Brass, Inc., reports for the quarter ended March 31 net loss of $408,490 after interest, depreciation, etc., comparing with net loss of $375,600 in the first quarter of 1932.

# Automotive Daily News

"Of, By and For the Entire Automotive Industry"

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## *Production and Sales*

IN a recent morning's mail there arrived a somewhat agitated letter from one of our earnest dealer readers, containing the following paragraph: "I notice that, now that business appears to be improving just a little bit, every front page of Automotive Daily News is filled with boasts by the factories of how much they are beating last year's production every month. I suppose this means the usual thing. As soon as business really gets better, not just a shade, as it is now, the plants will begin jamming cars down our throats until we suffocate again."

We can understand our reader's fear of unpleasant happenings, but we think it is utterly misplaced. In the first place, he errs in saying that our first page is filled with factory boasts of continuous increases in output. As a matter of fact, there have been very few statements even as regards production records. The factories have adopted a rather secretive attitude on their production activities. They are all of them glad to make public statistics covering their sales, but certainly sales totals should not offend any dealer; quite the reverse.

**As a matter of fact, production and sales totals today are almost interchangeable. All one has to do is subtract from the production figures a percentage for exports and make an allowance for dealer sampling and cars in transit, and there appears the sales total.**

Whether or not he knows it, our dealer reader is one of the factors in setting the production schedules at the present time. There is not a manufacturer in the industry today who is not setting his output by the demand from his dealers. In most factories the output is being gauged by the orders received the day before, though this rule has been relaxed a little in some cases.

We believe that we can honestly assure our reader that never again will the factories arbitrarily set a production figure and then boast about it being large. We believe that from now on, regardless of the prosperity that may come, the dealer organization always will be consulted in setting output schedules. We believe the day of cramming dealers with cars is at an end. For which relief, much thanks.

## *They Will Buy*

IN the old days, when business was booming, the automobile industry placed great reliance on the farm market. With the coming of depression, the farm market simply evaporated. The farmers still need motor transportation, but our brilliant conduct of our financial affairs had left the unfortunate agriculturalist in a position where he had nothing to use for money. It is generally believed that the automotive industry will not regain its one-time prosperity until it gets back its farm market.

**In this connection we were very much interested in a report received from Utah that motor vehicle sales in that area in April have staged a remarkable comeback. Complete figures are not yet available, but out report says that in Salt Lake City alone more than 500 cars were sold in April, more than in a long time.**

Utah goes in heavily for sheep raising and for beet sugar growing. Now, wool has been staging a sensational advance recently, the price going up as much as 15 cents a pound. This is actually a rise of about 25 per cent. from recent lows. Sugar prices also have been staging rather irregular advances. The advance in wool prices came just at the time when Utah sheep farmers were beginning their spring shearing. They are going to have more cash in hand than they have had in a long time.

This improvement in the financial condition of farmers specializing in these two types of products has been instantly reflected in purchases of motor transportation units. The point we want to emphasize is that the farmers need motor transport just as much as they ever did, and want to buy it. Give us increased prices for farm products generally and we shall have the farmers flooding back into the motor vehicle market immediately. Encouraging.

# 30-HOUR WEEK WOULD ADD TO UNEMPLOYMENT

**The following article was written by S. C. Robbins of Detroit and submitted to Automotive Daily News before the administration in Washington had indicated that it would not seriously urge the adoption of the Black thirty-hour work week bill. Many of the points raised in Mr. Robbins' letter might prove of interest in event of the revival of such legislation in the future. Mr. Robbins took a similar stand on the Share-the-Work movement which created considerable interest some time ago—ED. NOTE.**

*By S. C. ROBBINS*

The Black thirty-hour-week Senate bill, if enacted into a law, will increase unemployment instead of putting more men to work, as its sponsors claim. On the surface, however, it does seem that such a measure would increase work, but when we view the plan in the larger sense, as it applies to our entire economic system, we discover that, in reality, it accelerates unemployment.

If several million men now idle could be given work through the enactment of this bill, who would be selfish enough to oppose it, regardless of the hardships it might work upon certain industries? In times of distress and threatened national disaster personal opinions and personal interests are secondary. There would be no industry which would not gladly do all possible to adjust itself to a law wherein millions would be re-employed, but no such benefits accrue from the measure in question. Instead, it robs the worker of the very substance he now uses to support our economic system.

A careful analysis of the question will disclose that, due to the intricate workings of economic laws, every time the thirty-hour week plan gives one hour's work to a man, now idle,, it will rob a man, now employed, of possibly an hour and ten minutes work or more. This is beincause purchasing power is taken from the man who is now using it to buy commodities, the production of which gives employment to 75 per cent. of our workers, and given to the man who will use it to purchase commodities, the production of which requires but 25 per cent. of the employed workers. To grasp this fact we must remember that so far as general prosperity is concerned, that is, you and I, the most important part of the other man's earnings is the margin he has left after paying for bare necessities, that is, food, clothes and shelter.

Not more than 25 per cent. of our workers are needed to produce these things. The other 75 per cent. of the people who work must obtain employment from producing what are known as conveniences, comforts and luxuries—things we can get along without when compelled to do so. But when we do get along without them the result is a business depression such as we are now experiencing. We are forced to do without comforts and luxuries as our earnings are reduced to a point where a larger percentage of them are required to provide the essentials of life, and also when they are consumed for such non-productive purposes as paying debts and taxes. It is the margin of earnings a man has left after paying for these things which he uses to purchas homes, automobiles furniture, radios, electric refrigerators and the hundred-and-one other comforts and conveniences which provide employment for you and me, and 75 per cent. of the other people who must work for a living.

To comply with the thirty-hour week law, the workers' earnings are automatically reduced, which likewise reduces to a much greater degree and, in many cases, wipes out entirely, the margin he now uses for purchasing the products that require the most labor for manufacturing. For example, if a man is now drawing $30 for working forty hours per week, he will have to take a 25 per cent. cut when the thirty-hour law goes into effect. He will then make $22.50 per week, and this leaves him $7.50 less with which to make payments on commodities that give work to other men. As a result, the men who have been depending upon the purchasing power of this $7.50 will now be out of employment. This $7.50, it is true, will be passed on to the man who shares the work on the thirty-hour week basis, but he, too, will be earning only enough to purchase bare necessities, and will have no margin left to purchase an automobile, for example, which, if he did, would give work to one man for several months.

Of course, politicians making grand stand plays for votes, and labor agitators likewise deceiving the workers into supporting them in ease and comfort, claim that industry can and should comply with the thirty-hour week law by reducing hours, adding more workers to the pay roll, and at the same time maintain or increase present wage scales. That sounds easy, but read the financial statements of industry as they have been and are being published quarterly, and it will be seen that industry is being gradually driven into bankruptcy. When we read some company's financial statement and see a loss of $5,000,000, for example, let's bear in mind that 90 per cent. or more of that money went into wages in one form or another, and, in reality, such losses can be considered as the stock and bond holders' contribution to keeping men at work who would otherwise have had no jobs.

We hear a lot of loose talk about getting more money into circulation, and the supporters of the thirty-hour week bill claim this measure will do so. But, in the first place, prosperity does not depend upon the amount of money in circulation. This is proved by the fact that we now have about 25 per cent. more money in circulation than at any time during the boom year of 1929. The thing that controls prosperity is how money is spent, and what it is spent for. The success of our economic system depends not upon the rapid passing of cash money from person to person, but upon velocity of credit. For example, statistics show that the actual turnover of cash in a normal business year may not exceed $120,000,000,000, while the turnover of credit, or business transaction done on credit, in the same year may total $900,000,000,000. This important point can best be understood by a simple illustration: Give a hundred men $1 each, and let them spend it for such incidentals as razor blades, tooth paste, socks, handkerchiefs, food and other similar items, and when they have thus spent the $100, there has been just $100 worth of business created or transacted.

Now take the same $100 and divide it equally among ten men, and let each use it as the down payment on, say, a $100 article, which was the way we did it in 1929 and the years immediately preceding. In this case the $100 serves to create $1,000 worth of business and should give employment to ten times as many men as the same $100 spent on a cash basis, which is the way to carry on business when the money in circulation is spread so thin we use it as fast as we obtain it to provide the bare necessities on a day-to-day cash basis. This illustration shows why unemployment cannot be relieved, nor economic ills corrected, by a scheme like a five-day thirty-hour work week, the chief object of which is to spread still thinner the money circulating among a larger number of workers, so they theoretically will each have a few dollars with which to purchase food, clothes and shelter. A worthy purpose if it would work, but to solve the unemployment problem it must be attacked at its source, and obviously, the thirty-hour week does not do so. One effective way would be to reduce taxes, say, 75 per cent., so the present workers could use the billion of dollars thus saved to purchase homes, furniture, automobiles and similar commodities, because it is the production of such things we must depend upon to keep our millions of workers employed.

## STEEL RATE RISES 1% AT YOUNGSTOWN

(Continued from Page 1)

capacity, against 20 per cent. a week ago and 21 per cent. on last Monday.

A new crop of price advances in the Youngstown and neighboring steel districts indicated buyers may drive steel output still higher before the present upswing ends.

Pittsburgh Crucible Steel Company's Midland plant has increased raw steel and finished output, lifting operations to 40 per cent. A Jones & Laughlin Steel Corporation blast furnace at Aliquippa, Pa., idle at eighteen months, was blown in Wednesday. Refrigerator makers, important buyers of Youngstown district mills, report record sales and demand for ice box cases has lifted operations at Truscon's Steel Company's plant at Cleveland where steel makers report output at 47 per cent.

Republic Steel Corporation will blow in a blast furnace at Birmingham in a few days and is preparing an additional openhearth furnace at Youngstown for operating.

**Pittsburgh, May 4.**—The Wheeling Steel Corporation is operating at 33 per cent. capacity compared with 23 per cent. several weeks ago. For the entire district the percentage is 46.

The Alleghany Steel Company, New Kensington, Pa., now is operating at capacity, with 2,600 men employed.

## METAL TIRE COVER MAKERS REACH PATENT AGREEMENT

**Milwaukee, Wis., May 4.**—Metal tire patent suits brought against the Federal Pressed Steel Corporation of this city by Lyon, Inc., and Lyon Cover Company, which is a subsidiary of Houdaille-Hershep Corporation, Detroit, have been settled, according to George F. Markham, Federal president. As a result, the Lyon interests have acquired all of the patents and patent applications pertaining to metal tire covers owned by Federal as well as that department of Federal's business.

The Milwaukee plant will continue the manufacture of metal tire covers for several months when production will be moved to Detroit. Fred L. Flanders, Lyon Cover president, stated that his plant would manufacture the Federal line at Detroit as well as continue the present Lyon output.

## COMING EVENTS

**JUNE**

8—**New York.** Annual meeting of National Automobile Chamber of Commerce.
12-15—**Boston, Mass.** National Association of Purchasing Agents, eighteenth annual International Convention and Informashow, Hotel Statler.
12-16—**Chicago.** American Oil Burner Association meeting, Stevens Hotel.
16-17—**Louisville, Ky.** American Automobile Association meeting.
18-July 3—**Bordeaux, France.** Automobile, nautical and aeronautical show.
26-30—**Chicago.** American Society of Mechanical Engineers, meeting.
26-30—**Chicago.** American Society for Testing Materials, meeting, Stevens Hotel.

**JULY**

1-4—**Chicago.** American Air Races, Municipal Airport.
10-14—**Chicago.** Automotive Engine Rebuilders Association, meeting.
16-18—**Chicago.** National Team and Motor Truck Owners' Association, thirty-first annual convention, Palmer House.

**AUGUST**

28-Sept. 24—**Chicago.** Chicago Society of Automotive Engineers, International Automotive Engineering Congress, Palmer House. (This meeting will be wide in scope to take in the activities previously covered in the summer meeting and the aeronautical meeting.)

**SEPTEMBER**

11-15—**Chicago.** American Chemical Society, meeting.
20-22—**Atlantic City, N. J.** National Petroleum Association, Traymore Hotel.
21-22—**Chicago.** National Association of Motor Bus Operators, Congress Hotel.

**OCTOBER**

.....—**Paris, France.** Twenty-seventh International Automobile Exhibit.
2-6—**Detroit, Mich.** National Metal Congress.
2-6—**Chicago.** National Safety Congress.
5-15—**Paris, France.** International Automobile Salon.
12-21—**London, England.** Twenty-seventh International Automobile and Motorboat Show.
23-28—**Chicago.** Motor and Equipment Manufacturers Association, National Automotive Maintenance Exposition, Herbert Buckman, manager.
24-26—**Chicago.** American Petroleum Institute, meeting.
27-28—**Chicago.** National Standard Parts Association, convention, Stevens Hotel.
30-Nov. 3—**Chicago.** National Standard Parts Association, trade show.

# Production—Engineering—Factory

**Edited by Herbert Chase**

## SOME FUNDAMENTALS IN GEARS AND GEAR DESIGN

*By THOMAS J. BANNAN*

*Vice-President and Manager Western Gear Works, Seattle*

**(Abstracted from a paper presented before the Northwest section, Society of Automotive Engineers.)**

All of the gear systems in general use at the present time are necessarily compromises. It is possible to add many more improvements in gear-tooth action, and you may have noticed in some of the latest automotive transmissions tooth proportions are very much different from the old stub tooth with which we all have become so familiar. It is the speaker's opinion that eventually the teeth on all automotive gears will be designed for each specific service.

There can be little objection to varying automotive gears from existing standards if improved action results, because the quantity of units produced is sufficiently large to reduce tooling and designing cost to an inconsiderable amount and reproduction in any other plant than the original producer is not a consideration. For years the Caterpillar Tractor Company, and others, have laid out each pair of gears and varied the tooth proportions to suit their idea of the ideal.

The use of long and short addendums in gears will also become more popular. In spur and helical gears the resultant advantages of changing the addendum and dedundum has not been utilized, as it has in bevel gears. Several systems have been suggested for standard use in general practice, which appear to be improvements and, except for more complex computations, which is unimportant, and a slight increase in tooling expense, they could be advantageously adopted without much complication. Some of the patented and advertised systems, such as the Maag and the Hammer, use the principle of long and short addendums and thereby make the tooth shape of the pinion more desirable.

Another system being advocated at present is known as the "Integral Contact System." As I understand it, the aim is to get the same tooth strength in contact at all times regardless of the relative positions of the teeth. Assuming accuracy, the total tooth strength resisting deflection then remains constant. Theoretically, if obtainable, this appears ideal, but there are complications and as with all new systems of tooth forms, "no improvement in design alone will outweigh the importance of careful and painstaking workmanship in the production and mounting of gears," says Buckingham.

One interesting point regarding bevel gears is that while spiral bevels are mentioned as early as 1820, the first machines commercially practical for cutting them were not manufactured until about twenty years ago, and in 1913 Packard first introduced spiral bevel gears into automobile service. Packard also introduced hypoids to the industry in 1926. The machines for cutting both of these types of gears, as well as practically all bevel gears made in the United States, and in the world, for that matter, are made by the Gleason Works.

Increased life and decreased noise result from the use of spiral and helical teeth in either spur or bevel gears for numerous reasons. Some of the more important are: First, the teeth of the contacting gears do not come into mesh across the whole face at the same time. Hence, any discrepancies in spacing or variations in circular pitch due to deflection or inaccuracies are not severely felt as an impact. In other words, the teeth slide into mesh at one end of the face with only partial strength available to withstand errors in pitch or profile. Second, there is always some portion of one or more pitch lines in contact. Gear teeth are really cams, sliding into mesh, rolling and sliding out of mesh. The rolling action is the most desirable, as where sliding occurs there is apt to be more wear. Spur gears that wear on the tooth profile usually wear above and below the pitch line, ridging it is called, but helical gear action, since a pitch line is always in contact, tends to reduce sliding wear to a minimum. This same action tends to correct discrepancies in the tooth profile. Third, it can be shown that the actual width of tooth contact is greater in helicals than in spur gears of equal face width and greater also than the increase in normal load due to the angle. Fourth, the load capacity of helical teeth is greater because, while the actual contact on each tooth is only part of the tooth, the portion of the tooth on either side of the contact line is also adding strength.

Worm gears are in a class by themselves, and, except under certain conditions, the speaker is somewhat prejudiced against their use. Their inherent inefficiency is patent, and, frequently, when wear starts, it is absolutely impossible to arrest it. One point in their favor is that, as they wear out, the tooth contour of the gear is not destroyed, but may be worn to the proper shape if the worm profile is not damaged; moreover, their arrangement is simple, and they are capable of withstanding high peak loads momentarily.

(Continued on Page 6)

## Hydraulic Transmission

**The B. A. Wesche Electric Company, Cincinnati, O., is placing on the market a new hydraulic transmission of a type that embodies neither oil storage tank nor relief valves. The manufacturers explain the design by saying that its principle is analagous to an annual column of oil used as a rack, the pump functioning as a pinion, meshing with the rack in various ratios. The device is applicable to cranes and hoists, machine tools, testing machines and mechanical stokers.**

The volume control unit may be operated by screw pressure, by cam or plunger movement, as is demanded by the machine to which it is applied. No valves are needed to operate the work piston. When it is desired to reverse the direction of this piston, movement of the oil column is reversed, either by reversing the driving motor or changing the position of the pendulum that carries the piston and cylinder assembly.

The pump rotor has five pistons and is mounted as a pendulum. Reaction to the generated oil pressure is taken on a spring mounted in a cartridge, one end of which is in contact with a piston under oil pressure. In this way the rotor is held in equilibrium until displaced by the screw plunger or cam adjustment. By changing the spring, the pump can be made to operate at any pressure up to 5,000 pounds per square inch.

The unit is protected against overload, the protecting unit being either mechanical or hydraulic. The latter automatically regulates generator displacement of the pump, the cycle being continued when the overload is removed. There are only seven moving parts in the device and anti-friction bearings are used wherever necessary. The generator may be operated in any position. It is claimed that the temperature rise is negligible even in continuous operation under full load.

## NEW DIESEL SYSTEM DESIGNED FOR PRESENT GASOLINE ENGINE

**San Francisco, Cal., May 4 (UTPS).—The latest development of Atlas Imperial Diesel Engine Company is a Diesel fuel injection system for conversion of standard L-head engines. It is said to be capable of transforming an ordinary high-compression gasoline engine into a Diesel type. It is claimed to be particularly adaptable to heavy-duty motor truck engines, it is said to have proved highly successful in long distance haulage tests.**

Trucking systems of the Pacific Coast and intermountain states have been sharing in experimental tests, and declare the invention particularly effective and economical on long runs where consistent speed and power are prime requisites.

At present the company is preparing for large-scale production. Actual deliveries are scheduled for completion within the next sixty days. The new product will be marketed through its own organization, but supplemented by production contracts with automotive and boat-engine manufacturers. A contract with one large Eastern firm is now in process of negotiation.

Some time ago the Atlas Company developed the two-cycle small-power precombustion Diesel engine for rural use.

## Announce Lubrication Engineering Meetings

**New York, May 4.—Announcement has just been made by the American Society of Mechanical Engineers of a lubrication engineering meeting to be held under the joint auspices of the lubrication engineering committee of the petroleum division of the society and the Pennsylvania State College. The meeting is to be held May 25 and 26 at the Nittany Lion Inn, State College, Pennsylvania. An outline of the parts of the program likely to be of interest to automotive engineers follows:**

**THUSDAY, MAY 25**

**10.30 A. M.—Opening Session**

Presiding officer, R. L. Sackett, dean of engineering, the Pennsylvania State College.

"Practical Interpretation of Lubricant Specifications," by J. G. O'Neill, chief chemist, U. S. Naval Engineering Experiment Station, Annapolis, Md.

**2 P. M.—Machine Design Session**

Presiding officer, G. B. Karelitz, manager transportation division, Westinghouse Electric and Manufacturing Company, Philadelphia, Pa.

"Machine Design for Lubrication," by E. M. Barber, Elliott fellow, and C. C. Davenport, Texaco fellow, the Pennsylvania State College.

**8 P. M.—Standardization Session**

"Discussion of Viscosity Lubricant Standardization for Industrial Equipment," by Dr. A. E. Becker, Standard Oil Development Company, New York, N. Y.

**FRIDAY, MAY 26**

**10 A. M.—Gear Session**

Presiding officer, L. J. Bradford, professor of machine design, the Pennsylvania State College.

"Applications of Extreme Pressure Lubricants to the Lubrication of Inrustrial Machinery," by Dr. O. C. Bridgeman, Bureau of Standards, Washington, D. C.

"Problems of Lubricating Heavy Duty Gear," by Austin Kuhns, Farrell-Birmingham Company, Buffalo, N. Y.

## ARMY MODERNIZING LIBERTY ENGINE

**As originally designed, the Liberty aircraft engine was a water-cooled twelve, but with the development of air-cooled engines for aircraft, the air service converted the vee-twelve Liberty to an air-cooled power plant. This was so satisfactory that the ordnance and other War Department divisions are now adopting it for many ground uses.**

On certain engines, in addition to the outside cooling, a blast of air is led inside the crankcase and directed against the hot piston heads and cylinder walls. The warm air is then piped out of the crankcase.

Army engineers have been working very closely with the Franklin Automobile Company of Syracuse for several years past in the development of air-cooled engines for military use.

## *Six Truck Sales Leaders for March, 1933*

**Returns for today: Colorado, Iowa, Kentucky, Maine, Mississippi, Nevada, Tennessee, Texas and Wyoming.**

**In this table: 47 states and the District of Columbia.**

**Figures for February, 1933, will be found on Page 8.**

| MARCH, 1933 State | Sales | FIRST | | SECOND | | THIRD | | FOURTH | | FIFTH | | SIXTH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 149 | Chev | 112 | Ford | 23 | Int | 6 | GMC | 3 | Au-D | 2 | Stude | 1 |
| Arizona | 37 | Chev | 24 | Ford | 11 | D-In | 1 | | | | | | |
| Arkansas | 135 | Chev | 86 | Ford | 30 | Int | 11 | Dodge | 3 | Stude | 2 | Au-R | 1 |
| California | 463 | Chev | 226 | Ford | 119 | Int | 24 | Dodge | 23 | GMC | 16 | Autocar | 9 |
| Colorado | 99 | Chev | 48 | Ford | 19 | GMC | 11 | Int | 6 | Mack | 3 | DT-D-Fe-WO | 2 |
| Connecticut | 153 | Chev | 61 | Ford | 40 | Int | 17 | Dodge | 12 | Reo | 8 | GMC | 4 |
| Delaware | 47 | Chev | 31 | Ford | 10 | Int | 5 | GMC | 1 | | | | |
| Florida | 201 | Chev | 81 | Ford | 49 | Int | 27 | Austin | 25 | GMC | 6 | Dodge | 4 |
| Georgia | 113 | Chev | 69 | Int | 15 | GMC | 9 | Ford | 5 | Federal | 4 | Austin | 3 |
| Idaho | 18 | Chev | 12 | Int | 3 | D-F-I | 1 | | | | | | |
| Illinois | 599 | Chev | 198 | Ford | 107 | Int | 105 | DT | 49 | Dodge | 37 | GMC | 24 |
| Indiana | 404 | Chev | 195 | Ford | 73 | Int | 59 | Indiana | 20 | Dodge | 13 | GMC | 12 |
| Iowa | 218 | Chev | 114 | Int | 48 | Ford | 32 | DT | 7 | D-G | 5 | Fe-Ro | 2 |
| Kansas | 106 | Chev | 63 | Ford | 25 | Int | 11 | Dodge | 3 | Reo | 2 | G-Wo | 1 |
| Kentucky | 150 | Chev | 56 | Ford | 37 | Int | 29 | Dodge | 10 | Stude | 6 | DT | 5 |
| Louisiana | 55 | Chev | 27 | Ford | 12 | Int | 11 | D-G | 2 | Stude | 1 | | |
| Maine | 91 | Chev | 42 | Ford | 24 | Int | 8 | White | 6 | D-R | 3 | * | 1 |
| Maryland | 163 | Chev | 73 | Ford | 31 | Int | 21 | Dodge | 9 | Brock | 7 | GMC | 5 |
| Massachusetts | 350 | Chev | 142 | Ford | 85 | GMC | 27 | Int | 26 | Dodge | 20 | Reo | 10 |
| Michigan | 319 | Chev | 132 | Ford | 60 | Dodge | 42 | Int | 41 | Reo | 15 | GMC | 10 |
| Minnesota | 264 | Chev | 147 | Ford | 44 | Int | 35 | DT | 14 | Dodge | 7 | GMC | 6 |
| Mississippi | 79 | Chev | 46 | Int | 15 | Ford | 12 | Au-G | 2 | D-S | 1 | | |
| Missouri | 679 | Chev | 355 | Ford | 128 | Int | 89 | Dodge | 37 | GMC | 17 | DT | 14 |
| Montana | 107 | Chev | 43 | Ford | 34 | Int | 21 | Dodge | 5 | GMC | 2 | Fe-M | 1 |
| Nebraska | 152 | Chev | 82 | Ford | 29 | Int | 22 | DT-D | 6 | G-Wo | 2 | I-M-R | 1 |
| Nevada | 8 | Int | 3 | Chev | 2 | F-G | 1 | | | | | | |
| New Hampshire | 73 | Chev | 38 | Ford | 16 | Int | 8 | GMC | 4 | DT | 3 | Dodge | 2 |
| New Jersey | 354 | Chev | 148 | Ford | 81 | Int | 44 | White | 18 | Federal | 14 | GMC | 10 |
| New Mexico | 30 | Chev | 19 | Ford | 8 | In-S-W | 1 | | | | | | |
| New York | 853 | Chev | 312 | Ford | 181 | Int | 89 | Dodge | 63 | DT | 35 | GMC | 30 |
| North Carolina | 199 | Chev | 112 | Ford | 44 | Int | 20 | Austin | 7 | GMC | 5 | Dodge | 4 |
| North Dakota | 16 | Chev | 8 | Int | 3 | D-F | 2 | DT | 1 | | | | |
| Ohio | 368 | Chev | 157 | Ford | 75 | Int | 55 | Dodge | 24 | GMC | 14 | White | 10 |
| Oregon | 71 | Chev | 36 | Ford | 11 | Int | 9 | D-G | 6 | Reo | 1 | | |
| Pennsylvania | 919 | Chev | 392 | Ford | 196 | Int | 124 | Dodge | 58 | GMC | 25 | Reo | 18 |
| Rhode Island | 62 | Ford | 21 | Chev | 14 | Dodge | 7 | Int | 6 | GMC | 3 | I-R | 2 |
| South Carolina | 130 | Chev | 82 | Ford | 35 | Dodge | 5 | Int | 3 | Austin | 2 | Fe-G-I | 1 |
| South Dakota | 39 | Chev | 21 | Int | 6 | D-F | 4 | Stude | 3 | DT | 1 | | |
| Tennessee | 86 | Chev | 54 | Ford | 12 | Int | 9 | Federal | 5 | Au-D | 2 | St-S | 1 |
| Texas | 542 | Chev | 336 | Ford | 97 | Int | 58 | Dodge | 12 | GMC | 11 | Stude | 3 |
| Utah | 50 | Chev | 30 | Ford | 11 | Dodge | 3 | G-In | 2 | White | 1 | | |
| Vermont | 38 | Chev | 14 | Ford | 9 | Int | 4 | DT-I | 3 | D-W | 1 | | |
| Virginia | 262 | Chev | 156 | Ford | 58 | Int | 17 | GMC | 8 | Dodge | 6 | Au-DT | 4 |
| Washington | 100 | Chev | 40 | Ford | 28 | Int | 15 | GMC | 8 | D-R | 2 | * | 1 |
| West Virginia | 105 | Chev | 61 | Ford | 18 | Int | 10 | Dodge | 5 | GMC | 3 | Stude | 2 |
| Wisconsin | 191 | Chev | 86 | Ford | 39 | Int | 35 | DT | 11 | Dodge | 5 | G-R | 4 |
| Wyoming | 37 | Chev | 24 | Ford | 7 | Int | 3 | I-R-S | 1 | | | | |
| District of Col. | 62 | Chev | 28 | Ford | 15 | GMC | 10 | Autocar | 6 | D-In | 2 | Au-Fe-M | 1 |

# SOME FUNDAMENTALS IN GEARS AND GEAR DESIGN

(Continued from Page 5)

I have met a number of users of trucks who maintain that the results obtained with a worm drive are equal or superior to those they have experienced with double-reduction units, utilizing spiral bevel and helical gears. It is difficult for me to credit this, and I think it must be because peak or consistantly heavy loads were not regularly encountered.

Hypoid gears, because they are the newest type in general use, are, perhaps, the most interesting. Even now they are not in general use, one reason being that their production requires new equipment. The action of hypoid gears is similar to spiral bevels, except that additional sliding is introduced. It is claimed that this additional sliding is not objectional because the wiping effect aids lubrication and tends to smooth and to correct tooth contours.

The principal reason for the development of this type of gear was to permit the lowering of the drive shaft of an automobile with respect to the axle. The center lines of the shaft of spiral bevel gears, and all bevels, must intersect. The shafts of hypoids are offset. This is a definite advantage claimed over the standard spiral bevel set. With spiral bevels the spiral angle is the same in both gear and pinion, but in hypoids, while the angle of the gear varies from five to fifteen degrees, the angle of the pinion may be as high as thirty-five or forty degrees. This peculiarity means that for the same ratio the diameter of the hypoid pinion will be 15 to 20 per cent. larger than a similar spiral bevel pinion. A third advantage is that with non-intersecting shafts a bearing can be placed in front of the pinion and shaft stresses. On the other hand, where the front bearing is not convenient or practical, the hypoid pinion must overhang further, because of its position with respect to the gear. Hypoids are becoming increasingly popular, even in industrial work.

Probably the question most frequently asked is: "Are these gears strong enough to carry the load?" or we are asked to recommend or design a pair of gears to accomplish certain results, which implies the same question.

It is evident that in the design or use of gears it is most important to know something about the duty and the grade of gear to be utilized. Effectiveness of lubrication is equally important. Many users consider a cut gear is merely a cut gear. They have not the least conception of the variations in accuracy. Neither do they realize that the results obtained are frequently in direct proportion to accuracy, all other things being equal. Both the American Gear Manufacturers Association and the British Standards Institution have recently graded gears according to general classes based upon care in production.

Another fact of importance and interest is that gears of equal quality may be stressed differently when used for different purposes. It is claimed, and we have every reason to believe the hypothesis will eventually be proven a fact, that gears, like bearings, have a critical point above which they will operate, but fail very rapidly, and below which they will run indefinitely without severe or dangerous wear. Therefore, the intensity and frequency of the maximum load, as well as the manner in which it is applied is important. Passenger car service is not considered severe on gears. Truck and tractor service is considered more severe. Industrial applications are also subject to grades, but generally lower stresses are used in computing gears for this service than for gears in automotive duty.

The Lewis formula, which was first presented before the Engineers Club of Philadelphia in 1893, is generally used in computing gear capacity today.

Lewis assumed that the whole of the tangential force acts on a single tooth, and at the extreme end. The pressure is applied at an angle equal to the pressure angle. Each tooth is considered a cantilever beam, and a strength parabola may be inscribed in the tooth section, the height being equal to the distance from the base of the tooth to the point where the angential pressure line at the end of the tooth intersects the radial center line of the tooth. As with any cantilever beam, the strength of the tooth is then considered a function of the length and base width of the parabola. From this assumption various constants have been tabulated from the commonly used variations of tooth relationships and number of teeth. These are referred to when we apply the familiar Y-factor in the Lewis formula.

As Lewis originally presented his formula, he made no allowance for pitch-line velocity. It was discovered, however, that gears available at that time which would transmit a given load per inch of face at a lower velocity would not do so equally well when they were speeded up. Assuming that capacities were related to the velocity, the Barth equation was added, and the allowable fiber stress was varied by a variable factor, depending upon the pitch-line velocity.

Evidently some of the assumptions by Lewis and Barth are not accurate, but, to this day, there has never been a fitting or easily applied substitute presented. Much work is being done at present, but I think I can safely say that the Lewis formula, or a variation of it, is still used by 90 per cent. of all engineers in computing gear capacity. As a result of the basic errors in the formula most designers have resorted to empirical limitations, based upon experience, and because the errors are on the safe side, in the case of accurately finished gears, you will frequently find in practice, stresses substituted into the formulas that seem unreasonably high and suggest that the elastic limit of the material has been exceeded or at least that no factor of safety has been allowed. Working back

(Continued on Page 8)

# DODGE AND PLYMOUTH IN RETAIL DELIVERIES SHOW SHARP INCREASE

(Continued from Page 1)

creases over the corresponding period of last season, but it is, in point of actual retail deliveries, the largest business week since June 29, 1929.

A comparison of deliveries made to date this year with the turnover recorded for the corresponding period of 1932, shows 1933 deliveries 28.1 per cent. ahead of last year's.

# McKINNEY HEADS PACKARD SALES AND ADVERTISING

(Continued from Page 1)

pointed general sales and advertising manager of the company.

Mr. McKinney has been associated with the Packard company for twenty years. He has been advertising manager for the last ten years. Previously he was factory truck sales manager and truck sales manager at the Chicago Packard branch.

**ALLEGHANY STEEL**

**Pittsburgh**, May 4. — Alleghany Steel reports for the quarter ended March 31 net loss of $131,937 after depreciation, interest, taxes, etc., comparing with net loss of $366,378 in the 1932 quarter.

# *Cumulative New Commercial Car Registration Statistics, March, 1933*

**Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robinson Advertising Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Metropolitan district figures compiled by Sherlock & Arnold, New York city, are included in New York state total. Readers desiring county, city, or town lists, or lists of owners in any given section, may obtain these by addressing any of these three companies. Some of this data has been published previously, but it is given here complete for the convenience of our subscribers.**

**Returns for today: Colorado, Iowa, Kentucky, Maine, Mississippi, Nevada, Tennessee, Texas and Wyoming**

**In this table, 47 states and the District of Columbia**

**Comparative figures for March, 1932, will be found on Page 7.**

| States | Austin | Autocar | Brockway | Chevrolet | Diamond-T | Dodge | Federal | Ford | G. M. C. | Indiana | International | La France Republic | Mack | Pierce-Arrow | Reo | Rockne | Sterling | Stewart | Studebaker | White | Willys-Overland | Miscellaneous | Totals | States |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 2 | | | 112 | | 2 | | 23 | 3 | | 6 | | | | | | | | 1 | | | | 149 | Alabama |
| Arizona | | | | 24 | | 1 | | 11 | | | 1 | | | | | | | | | | | | 37 | Arizona |
| Arkansas | 1 | | | 86 | | 3 | | 30 | | | 11 | | | | 1 | | | | 2 | | | 1 | 135 | Arkansas |
| California | 4 | 9 | | 226 | | 23 | 1 | 119 | 16 | 4 | 24 | | | | 6 | 3 | | 1 | 8 | 8 | | 11 | 463 | California |
| Colorado | | | | 48 | 2 | 2 | 2 | 19 | 11 | | 6 | | 3 | | | | | | 1 | | 2 | 3 | 99 | Colorado |
| Connecticut | | | | 61 | 1 | 12 | 2 | 40 | 4 | 1 | 17 | | | 1 | 8 | 3 | | | 3 | | | | 153 | Connecticut |
| Delaware | | | | 31 | | | | 10 | 1 | | 5 | | | | | | | | | | | | 47 | Delaware |
| Florida | 25 | | | 81 | | 4 | | 49 | 6 | 3 | 27 | | | | 3 | | | | 2 | | | 1 | 201 | Florida |
| Georgia | 3 | | | 69 | | 2 | 4 | 5 | 9 | 1 | 15 | | 1 | | | | | | 1 | 1 | | 2 | 113 | Georgia |
| Idaho | | | | 12 | | 1 | | 1 | | 1 | 3 | | | | | | | | | | | | 18 | Idaho |
| Illinois | | | 1 | 198 | 49 | 37 | 7 | 107 | 24 | 1 | 105 | | 3 | | 9 | | 1 | 1 | 5 | 16 | 1 | 34 | 599 | Illinois |
| Indiana | | | | 195 | 5 | 13 | 3 | 73 | 12 | 20 | 59 | | 1 | | 4 | 6 | | 1 | 7 | | 1 | 4 | 404 | Indiana |
| Iowa | | | | 114 | 7 | 5 | 2 | 32 | 5 | 1 | 48 | | | | | 2 | | | 1 | | | 1 | 218 | Iowa |
| Kansas | | | | 63 | | 3 | | 25 | 1 | | 11 | | | | 2 | | | | | | 1 | | 106 | Kansas |
| Kentucky | | | | 56 | 5 | 10 | | 37 | 2 | | 29 | | | | 2 | 1 | | | 6 | | | 2 | 150 | Kentucky |
| Louisiana | | | | 27 | | 2 | | 12 | 2 | | 11 | | | | | | | | 1 | | | | 55 | Louisiana |
| Maine | | | | 42 | | 3 | | 24 | 1 | | 8 | | | 1 | 3 | | | 1 | 1 | 6 | | 1 | 91 | Maine |
| Maryland | | | 1 | 7 | 73 | | 9 | 1 | 31 | 5 | 2 | 21 | | 1 | | 2 | 1 | | | 2 | 4 | 1 | 2 | 163 | Maryland |
| Massachusetts | | | 5 | 5 | 142 | 9 | 20 | 3 | 85 | 27 | | 26 | 1 | 3 | | 10 | 1 | | | 4 | 4 | 1 | 4 | 350 | Massachusetts |
| Michigan | | | | | 132 | 1 | 42 | 5 | 60 | 10 | 2 | 41 | | 1 | | 15 | 1 | | | 4 | 2 | | 3 | 319 | Michigan |
| Minnesota | | | | 1 | 147 | 14 | 7 | 1 | 44 | 6 | | 35 | | | | 3 | | | | 1 | | | 5 | 264 | Minnesota |
| Mississippi | 2 | | | | 46 | | 1 | | 12 | 2 | | 15 | | | | | | | | 1 | | | 79 | Mississippi |
| Missouri | | | 3 | | 355 | 14 | 37 | 3 | 128 | 17 | 3 | 89 | | | | 3 | 2 | | | 9 | 4 | 2 | 10 | 679 | Missouri |
| Montana | | | | | 43 | | 5 | 1 | 34 | 2 | | 21 | | 1 | | | | | | | | | | 107 | Montana |
| Nebraska | | | | | 82 | 6 | 6 | | 29 | 2 | 1 | 22 | | 1 | | 1 | | | | | | 2 | | 152 | Nebraska |
| Nevada | | | | | 2 | | | | 1. | 1 | | 3 | | | | | | | | | | | 1 | 8 | Nevada |
| New Hampshire | | | | | 38 | 3 | 2 | | 16 | 4 | | 8 | | 1 | | | 1 | | | | | | | 73 | New Hampshire |
| New Jersey | 1 | 1 | 7 | | 149 | 4 | 14 | 1 | 81 | 10 | 8 | 44 | | 1 | | 4 | | | 1 | 1 | 18 | 1 | 8 | 354 | New Jersey |
| New Mexico | | | | | 19 | | | | 8 | | | 1 | | | | | | | | 1 | 1 | | | 30 | New Mexico |
| New York | 1 | 9 | 25 | | 312 | 35 | 63 | 4 | 181 | 30 | 15 | 89 | | 22 | 1 | 15 | 5 | 2 | 18 | 7 | 9 | 1 | 9 | 853 | New York |
| North Carolina | 7 | | | | 112 | 2 | 4 | | 44 | 5 | | 20 | | 1 | | | | | | 2 | 1 | | 1 | 199 | North Carolina |
| North Dakota | | | | | 8 | 1 | 2 | | 2 | | | 3 | | | | | | | | | | | | 16 | North Dakota |
| Ohio | 1 | 1 | | | 157 | 4 | 24 | | 75 | 14 | 2 | 55 | | 2 | | 8 | | | | 2 | 10 | 2 | 11 | 368 | Ohio |
| Oregon | | | | | 36 | | 6 | | 11 | 6 | | 9 | | | | 1 | | | | | | | 2 | 71 | Oregon |
| Pennsylvania | 9 | 9 | 6 | | 392 | 17 | 58 | 2 | 196 | 25 | 3 | 124 | | 8 | | 18 | 8 | | 6 | 14 | 8 | 6 | 10 | 919 | Pennsylvania |
| Rhode Island | | | | | 14 | | 7 | 1 | 21 | 3 | 2 | 6 | | | | 2 | 1 | | | | | | 5 | 62 | Rhode Island |
| S. Carolina | 2 | | | | 82 | | 5 | 1 | 35 | 1 | 1 | 3 | | | | | | | | | | | | 130 | South Carolina |
| S. Dakota | | | | | 21 | 1 | 4 | | 4 | | | 6 | | | | | | | | 3 | | | | 39 | South Dakota |
| Tennessee | 2 | | | | 54 | | 2 | 5 | 12 | | | 9 | | | | | | | 1 | 1 | | | | 86 | Tennessee |
| Texas | 2 | | | | 336 | 2 | 12 | | 97 | 11 | 1 | 58 | | 2 | | | 1 | | | 3 | 2 | | 15 | 542 | Texas |
| Utah | | | | | 30 | | 3 | | 11 | 2 | | 2 | | | | | | | | | 1 | | 1 | 50 | Utah |
| Vermont | | | | | 14 | 3 | 1 | | 9 | | 3 | 4 | | | | | | | | | 1 | | 3 | 38 | Vermont |
| Virginia | 4 | | | | 156 | 4 | 6 | 2 | 58 | 8 | | 17 | | 1 | | 2 | | | 1 | 1 | | | 2 | 262 | Virgina |
| Washington | 1 | | | | 40 | 1 | 2 | 1 | 28 | 8 | | 15 | | | | 2 | | | | | 1 | | 1 | 100 | Washington |
| W. Virginia | | | | | 61 | 1 | 5 | | 18 | 3 | | 10 | | 1 | | | | | | 2 | | | 4 | 105 | West Virginia |
| Wisconsin | | | | | 86 | 11 | 5 | | 39 | 4 | | 35 | 1 | | | 4 | | | 1 | 2 | | 2 | 1 | 191 | Wisconsin |
| Wyoming | | | | | 24 | | | | 7 | | 1 | 3 | | | | 1 | | | | 1 | | | | 37 | Wyoming |
| Dist. of Col. | 1 | 6 | | | 28 | | 2 | 1 | 15 | 10 | | 2 | | 1 | | | | | | | | | 7 | 73 | Dist. of Col. |
| Totals | 68 | 45 | 51 | | 4636 | 202 | 477 | 53 | 2009 | 313 | 76 | 1182 | 2 | 55 | 3 | 129 | 34 | 5 | 32 | 100 | 97 | 23 | 165 | 9757 | Totals |

# Battery Makers' Group Revises Trade Code

(Continued from Page 1)

N. B. M. A. meeting, there was an industry conference, attended jointly by members of the association and all others engaged in the battery business, this session being under the auspices of the industry co-operative committee, of which L. B. F. Raycroft of the Electric Storage Battery Company is chairman, and including C. O. Wanvig, Globe-Union Manufacturing Company; D. A. Graham, Red-Bar Battery Company; A. A. MacLean, U. S. L. Battery Corporation; R. D. Mowry, Universal Battery Company; L. Shields, National Battery Company; C. P. Bowers, Bowers Battery Manufacturing Company. This committee reported its efforts in connection with trade practice rules and fullly discussed what led up to its efforts and what had been accomplished. The adoptions of this committee were later approved and adopted by the N. B. M. A.

Officials and members of the association held to the belief that the most constructive measures before the spring meeting were the Trade Practice Conference Rules, which were adopted; and an amended form of standard warranty on batteries. The association, while having warranty rules, adopted certain amendments wherby some relatively slight changes have been made in the basis for determining the guarantee to be placed on different types and sizes of batteries, which revision should result in a more united front and better understanding of a basis arranged on a more scientific standard. Under the amended plan the warranty will be based on the ampere hour capacity at the twenty-hour rate. Provision is made for ninety-day guarantee of material and workmanship, with it being at the sellers' option to repair or replace an unsatisfactory or failed unit, while failure at beyond ninety days will be prorated at the owners' cost, on basis either of months or service, or thousand miles per month basis. A table was adopted covering the number of months warranty on each type and size of battery, based on ampere hour capacity. It was said that this adoption has been quite well agreed upon and should prove quite beneficial.

The first session of the N. B. M. A. was on Monday afternoon, at which the usual official reports were made, and the address of President E. D. Martin, which contained a great deal of worth while material, was read. Other than open or shop discussions most of the session was devoted to committee reports; while discussions regarding merchandising, advertising and distribution were participated in by and led by S. E. Baldwin, Cleveland, director of merchandising for Willard Storage Battery Company. S. W. Rolfe, vice-president and general manager, of Willard Storage Battery Company, also handled a paper on "Effect of Ampere Hour Capacity on Battery Life."

C. L. Feltkeller delivered a report as chairman of the consignment committee; A. R. Reid, as chairman of the data book committee; H. A. Harvey, dealer co-operation, and A. F. Strayer delivered a timely report on special compensation insurance, in which he told of many of the abuses of workman's compensation insurance on the part of industrial workers, pointing out that such abuses increase the cost of such insurance, as rates are based on experience of the companies and loss ratio.

E. H. Green, Jr., chairman of the publicity committee, was not present, but his report was read by Commissioner W. J. Parker. In this report trade papers were commended on their excellent co-operation, especially as regards the rebuilt battery campaign. Other committee reports were made by George H. Souther on patents, compensation and legislation; C. H. Munson, traffic; A. F. Strayer, uniform cost accounting; H. D. Stanley, rebuilt batteries; R. D. Mowry, ways and means; and H. B. Taylor, membership. Several of these committees had little or nothing to report. H. B. Taylor reported the loss of two or three manufacturing members as a result of their having dropped out of business or brands having been taken over by other companies, and also a few associate members were lost, while a number of new members, it was stated, are planning to come in by fall.

In some of these reports references were made to new legislation in Ohio, Oklahoma and California, regulating sales of rebuilt batteries.

The most important reports were reserved for Tuesday morning. E. H. Voges, as chairman of the statistical committee, among other things pointed to reduction of volume of replacement business in connection with scrapping of an average of 3,600,000 old cars per year, which means that more than 4,000,000 cars will have to be sold annually to prevent smaller markets, through steady decline in the number of automobiles and trucks in operation, this situation reducing the potential sales market. Mr. Voges displayed charts, of the graphic type, showing the decline. The suggestion was made and indorsed that such graphs be made up and distributed twice a year instead of once.

E. T. Foote, as chairman of the guarantee committee, made his report involving change of the association regulations to some extent, but this went through promptly, as it had been whipped in shape in previous discussions and committee meetings.

O. W. A. Oetting, chairman for the Technical Committee, presided over a discussion revolving around technical methods of installation and operation of battery life test procedures. This work is of vast importance to the battery manufacturer in knowing what his own batteries can be expected to do, as well as those of competitors, it being a proving ground for plates, separators, pastes, machine or hand applied pastes, containers and what not. In these discussions it was shown that good, bad or indifferent batteries average up quite well by class. Progress, in fact a lot of progress has been made in this connection over the year, and this work has become of considerable importance and growing importance, in that the proof of such laboratory taste give a very excellent basis on which to rate field service.

H. D. Stanley, Emark Battery Corporation, and R. O. Watkins, Universal Battery Company, were on the program for papers on "Life Test Procedure," but Mr. Watkins was not present, and H. B. Taylor, Eagle Pitcher Lead Company, handled Mr. Watkins' paper, which discussed the system of life tests as used by Universal and as revised over the past three years.

Mr. Stanley used a number of graphs to illustrate results of such tests on different capacity and grades of batteries, and results of high or low charge or discharge rates and equipment used.

Mr. Wilson, representing Prestolite, discussed the work done by Presto along these lines, arguing for automatic equipment in making such tests, and holding that these tests prove up in field work exceptionally well.

B. H. Schubert, National Lead Company, discussed "Automatic Discharge Apparatus," passing out photos showing automatic equipment developed for such tests and describing its arrangement, and how automatic equipment saves a lot of time and labor, as well as cost of securing information on results.

Chairman O. W. A. Oetting remarked that while much good information had been offered one paramount matter of interest to the manufacturer without such testing equipment, had not been touched on by any speaker, and that was the cost of installation.

Mr. Harner, Eangle Pitcher Lead Company, discussed equipment in use by that company on tests, and which, while not quite as elaborate or expensive in detail as that discussed by Mr. Schubert, the equipment had been in use for a year, and had secured splendid results. He held that it could be installed for approximately $100 or slightly more to take care of a single line of twelve batteries on test; or for a two-line, twenty-four-battery outfit, using 110-volt current, it could be installed at a cost not exceeding $250, a sum well worth spending, in that it provides technical knowledge or results of tests that are very valuable to the manufacturer in knowing how different materials, differently applied, will hold up.

In the various discussions it was shown that charging rates as used range from seven to ten amperes.

There was considerable meat in this discussion, which proved of considerable interest, as shown by the numerous questions fired at the speakers.

H. B. Taylor, reporting for the resolutions committee, dealt chiefly

(Continued on Page 8)

# *Cumulative New Commercial Car Registration Statistics, March, 1932*

Comparative figures for March, 1933, will be found on Page 6.

| States | Austin | Autocar | Brockway | Chevrolet | Diamond-T | Dodge | Federal | Ford | G. M. C. | Indiana | International | La France Republic | Mack | Pierce-Arrow | Reo | Rockne | Sterling | Stewart | Studebaker | White | Willys | Miscellaneous | Totals | States |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama, 1932 | | | | 89 | | 8 | 1 | 32 | 5 | | 15 | | | | | | | | 3 | | 1 | | 154 | Alabama, 1932 |
| Arizona, 1932 | | | | 30 | | 3 | | 13 | | | 5 | | | | | | | | | | | 1 | 52 | Arizona, 1932 |
| Arkansas, 1932 | | | | 44 | | 1 | | 29 | 1 | | 8 | | 1 | | | | | | | | | | 84 | Arkansas, 1932 |
| California, 1932 | | 6 | | 311 | 2 | 46 | 2 | 368 | 31 | | 47 | 6 | 1 | | 40 | | 2 | | 12 | 9 | | 83 | 966 | California, 1932 |
| Colorado, 1932 | | | | 50 | 1 | 4 | 1 | 72 | 2 | | 15 | | 1 | | | | | | | 2 | 2 | 4 | 154 | Colorado, 1932 |
| Connecticut, '32 | | 3 | | 100 | 3 | 14 | 6 | 49 | 9 | | 26 | 1 | 4 | 1 | 12 | | | | 4 | 3 | 3 | 2 | 240 | Connecticut, '32 |
| Delaware, 1932 | | | 1 | 24 | | 1 | | 17 | 3 | | 8 | | | | 2 | | | | | | | | 56 | Delaware, 1932 |
| Florida, 1932 | | | | 92 | | 5 | 1 | 124 | 4 | 1 | 21 | 1 | 1 | | 3 | | | | 2 | 1 | 1 | 3 | 260 | Florida, 1932 |
| Georgia, 1932 | | 1 | | 78 | | 3 | 1 | 72 | 4 | | 6 | | | | 2 | | | | 1 | 1 | 1 | 3 | 173 | Georgia, 1932 |
| Idaho, 1932 | | | | 26 | | | | 10 | | | 5 | | | | | | | | | | | 1 | 41 | Idaho, 1932 |
| Illinois, 1932 | | 1 | | 308 | 24 | 39 | 1 | 177 | 35 | | 118 | 1 | 3 | | 19 | | 1 | 1 | 14 | 2 | 9 | 27 | 780 | Illinois, 1932 |
| Indiana, 1932 | | 1 | | 191 | | 16 | 1 | 177 | 27 | 5 | 60 | 4 | | | 5 | | | 4 | 20 | 1 | 9 | 3 | 524 | Indiana, 1932 |
| Iowa, 1932 | | | | 194 | 4 | 10 | | 121 | | | 53 | | 3 | | 7 | | | | 8 | 2 | 6 | 12 | 420 | Iowa, 1932 |
| Kansas, 1932 | | | | 97 | | 8 | | 75 | 10 | 1 | 19 | | 1 | | 1 | | | | 1 | | | 6 | 219 | Kansas, 1932 |
| Kentucky, 1932 | | | | 51 | | 5 | | 48 | 3 | 3 | 25 | | 2 | | 3 | | | 1 | 2 | | 2 | 2 | 147 | Kentucky, 1932 |
| Louisiana, 1932 | | | | 49 | 1 | 5 | | 38 | 3 | | 20 | | 1 | | 1 | | | | 1 | 1 | | | 120 | Louisiana, 1932 |
| Maine, 1932 | | | | 88 | | 12 | | 32 | 7 | | 16 | | | | 4 | | 1 | | 2 | | | | 162 | Maine, 1932 |
| Maryland, 1932 | | 3 | 3 | 125 | | 19 | 6 | 42 | 7 | | 27 | 1 | 6 | | 5 | | | | 3 | 2 | | 7 | 256 | Maryland, 1932 |
| Mass., 1932 | | 11 | 3 | 216 | 3 | 36 | 13 | 211 | 43 | | 51 | | 12 | | 18 | | 2 | 10 | 8 | 19 | 1 | 5 | 662 | Mass., 1932 |
| Michigan, 1932 | | | | 206 | 6 | 60 | 10 | 180 | 18 | 1 | 29 | | | | 18 | | | | 17 | 1 | 6 | 16 | 570 | Michigan, 1932 |
| Minnesota, '32 | | | | 228 | 7 | 40 | 5 | 152 | 11 | | 81 | | 6 | | 14 | | 1 | | 12 | 7 | 6 | 1 | 571 | Minnesota, '32 |
| Mississippi, '32 | | | | 62 | | 4 | | 48 | | | 16 | | | | | | | | | | | | 130 | Mississippi, '32 |
| Missouri, 1932 | | 3 | | 616 | 22 | 50 | 7 | 376 | 37 | 7 | 150 | | 5 | | 24 | | 8 | 1 | 17 | 4 | 10 | 15 | 1352 | Missouri, 1932 |
| Montana, 1932 | | | | 61 | | 11 | 2 | 81 | 2 | 1 | 29 | | | | 9 | | | | 1 | 1 | 2 | 1 | 201 | Montana, 1932 |
| Nebraska, 1932 | | | | 87 | 3 | 6 | | 67 | 7 | | 30 | | | | 2 | | | | 3 | | 5 | 2 | 212 | Nebraska, 1932 |
| Nevada, 1932 | | | | 18 | | 1 | 1 | 4 | 2 | | 3 | | | | | | | | | | | 1 | 30 | Nevada, 1932 |
| New Hamp., '32 | | | | 44 | 6 | 6 | 1 | 20 | 4 | | 7 | 1 | 1 | | 2 | | | 3 | 2 | | 1 | 1 | 99 | N. Hamp., 1932 |
| New Jersay, '32 | | 9 | 6 | 260 | 33 | 38 | 4 | 119 | 22 | | 44 | 1 | 9 | 1 | 17 | | 2 | 6 | 5 | 14 | 2 | 30 | 622 | New Jersey, '32 |
| N. Mexico, '32 | | | | 15 | | 1 | | 17 | 2 | | 3 | | | | | | | | | | | | 38 | N. Mexico, 1932 |
| New York, 1932 | | 105 | 33 | 506 | 30 | 100 | 12 | 387 | 74 | | 138 | | 45 | | 36 | | 5 | 52 | 23 | 447 | 16 | 60 | 2069 | New York, 1932 |
| N. Carolina, '32 | | | | 171 | 2 | 8 | | 87 | 4 | | 11 | 1 | 1 | | 2 | | | | | 9 | | 25 | 321 | N. Carolina, '32 |
| N. Dakota, '32 | | | | 25 | | 4 | | 7 | 1 | | 18 | | | | 2 | | | | | | 2 | | 59 | N. Dakota, 1932 |
| Ohio, 1932 | | 1 | | 225 | 2 | 48 | 2 | 195 | 28 | 1 | 50 | 1 | 4 | | 14 | | | 6 | 6 | 9 | 7 | 45 | 644 | Ohio, 1932 |
| Oregon, 1932 | | | | 59 | | 6 | | 62 | 8 | | 9 | | | | | | 3 | | | 2 | | 1 | 150 | Oregon, 1932 |
| Penn., 1932 | | 14 | 10 | 508 | 13 | 90 | 5 | 415 | 43 | | 151 | 6 | 27 | | 49 | | 8 | 19 | 18 | 15 | 26 | 36 | 1453 | Penn., 1932 |
| Rhode Is., '32 | | | 1 | 40 | 1 | 2 | 4 | 26 | 4 | | 9 | | 2 | 1 | 6 | | | | 1 | 1 | 1 | 2 | 101 | R. Island, 1932 |
| S. Carolina, '32 | | | | 47 | | 8 | | 27 | 1 | | 2 | | | | | | | | 1 | | | 1 | 87 | S. Carolina, 1932 |
| S. Dakota, 1932 | | | | 33 | 2 | 4 | | 9 | 17 | | 17 | | 1 | | | | | | 3 | | 4 | | 90 | S. Dakota, 1932 |
| Tennessee, 1932 | | | | 60 | | 6 | 3 | 27 | 3 | 1 | 17 | | | | 1 | | | | | 1 | 3 | 1 | 123 | Tennessee, 1932 |
| Texas, 1932 | | | | 296 | 1 | 16 | | 204 | 10 | 1 | 56 | | 1 | | 6 | | | | 3 | 5 | | 10 | 609 | Texas, 1932 |
| Utah, 1932 | | | | 51 | | 4 | | 22 | 4 | | 11 | | 2 | | | | | | 1 | | | | 95 | Utah, 1932 |
| Vermont, 1932 | | | | 38 | 3 | 2 | | 18 | 2 | | 13 | | | | 2 | | | | | | 3 | 1 | 82 | Vermont, 1932 |
| Virginia, 1932 | | 5 | | 183 | | 12 | 1 | 100 | 7 | | 12 | 1 | | | 6 | | | | 3 | | | 4 | 334 | Virgina, 1932 |
| Washington, '32 | | | | 60 | 3 | 12 | 1 | 83 | 8 | | 18 | | 1 | | 1 | | | | 5 | 5 | | 14 | 211 | Wash., 1932 |
| W. Virginia, '32 | | 1 | | 75 | | 8 | 1 | 32 | 5 | | 13 | 2 | | | | | | | 4 | | 2 | 4 | 147 | W. Virginia, '32 |
| Wisconsin, '32 | | | | 230 | 10 | 20 | 1 | 135 | 9 | | 46 | 1 | 1 | | 8 | | 3 | 2 | 11 | 1 | 7 | 8 | 493 | Wisconsin, 1932 |
| Wyoming, 1932 | | | | 38 | | 4 | | 13 | 3 | | 4 | | | | 2 | | | | 1 | 1 | | | 66 | Wyoming, 1932 |
| Dist. of Col., '32 | | 2 | | 62 | 3 | 5 | 1 | 38 | 9 | | 38 | | | | | | | | | | | 11 | 169 | Dist. of Col., '32 |
| Totals, 1932 | | 166 | 57 | 6469 | 185 | 811 | 94 | 4658 | 539 | 22 | 1570 | 28 | 142 | 3 | 343 | | 36 | 105 | 218 | 566 | 138 | 448 | 16598 | Totals, 1932 |

# SOME FUNDAMENTALS IN GEARS AND GEAR DESIGN

(Continued from Page 6)

from actual conditions through the modified Lewis formula, it is possible to compute values for S in successful automotive gears above 100,000 or 120,000 psi, and stresses from 30,000 psi to those mentioned may reasonably be recommended if all conditions are accurately considered.

As a matter of fact, the greatest criticism of the Lewis formula is that it takes into consideration only the beam strength of the teeth and neglects the wear. Seldom today, in the higher grade industries or automotive gears, do we find a tooth bent over or broken out unless some factor not inherently related is the cause. I refer to something like faulty heat treatment, outside deflection caused by a weak case or bearing design, or some similar cause. Practically all gear failures today that are actually gear failures start with wear and when gears, particularly those of the automotive type, show typical wear signs such as pitting and ridging and at the same time tooth breakage, improvement will probably call for the application of the more advanced practices of the gear arts. What I mean is that simply raising the tensile strength of the metal utilized or making it harder, more than likely will not solve the problem to any satisfactory degree. If possible, a combination of both will help, but there are very definite limitations to where we can go with steel in heat treatment. Ductility and hardness usually vary inversely.

Theoretically, gear teeth have line contact, but since line contact would indicate infinite surface pressure, it is evident that other conditions prevail. The theory of compressibility of elastic bodies comes into consideration here, and it is evident that the maximum unit pressure must be kept below the ultimate surface strength of the material under compression.

A gear tooth, therefore, must be strong enough, when considered as a beam, to sustain the imposed load and also have sufficient surface strength to support this load on a limited area and resist unreasonable wear. The dynamic load imposed upon the teeth is equal to that load which is easily computed by reference to the torque transmitted plus an increment load which is caused by factors other than torque.

To explain—let us consider the hypothetical case of a pair of gears made of perfect material transmitting power from the prime mover which delivers the torque with absolute smoothness to a machine which absorbs it with equal smoothness. Loads on the teeth of such gears would be absolutely uniform and could be computed with reference to beam and surface strength directly from a consideration of the torque transmitted. However, such a set of gears would never be met in practice; first, because the power could not be delivered or taken away in the manner assumed; and, secondly, because the inherent limitations of the material and accuracy of machining are such that gears will set up in themselves additional dynamic stresses.

Consider a perfect pair of gears driven by a single cylinder gas engine. The loads on the various teeth are far from uniform. There would be terrific shock imposed upon them. Loads of this nature, of course, should be considered by the designer in the same manner as he would consider them with reference to the rest of the machine, by using a factor of safety. The point to be demonstrated, however, is, that with any flucuation, the dynamic tooth load varies.

The second point referred to, namely, that gears impose shock loads on themselves on account of the limitation imposed by material and accuracy of machining, is apt to be overlooked and therefore more important in an analysis required to arrive at an idea of the dynamic load imposed. Our hypothetical gears, mentioned above were made of perfect material and were perfectly accurate Naturally, there is no such perfect material that will not deflect or compress under pressure. And also, no matter how carefully they are produced, flaws, and we certainly do not refer to such inaccuracies in spacing or profile that will cause perceptible bumping, will always exist in the manufacture of gears.

Now then, these inaccuracies in the gear tooth profile, together with the varying amount of deformation of the profile under load, will cause the mass of the driving and driven shaft to change their velocity perceptibly. This change in momentum and velocity tends to cause the teeth surfaces to separate. After separation the surfaces come together again with an impact. This additional load caused by the impact is usually known as the increment load and its intensity is varied by factors mentioned later.

Some gears are more noisy when running lightly loaded than when running heavily loaded. The reason may be, though not necessarily, since the cause may be exterior, that inaccuracies in the teeth cause them to rebound and, lacking an applied load, they bound back and forth from one side of the tooth to the other, creating noise. In the case of a loaded gear, the teeth do not clatter to the same degree, but the tooth load will be greatly increased by the attempted change in rotative speed.

(To be continued)

# BATTERY MAKERS REPORT PROGRESS AT SPRING SESSION

(Continued from Page 7)

with thanking speakers, local interests, and others who aided in arrangements for the program, etc. There were no resolutions of a business nature.

In conclusion President Martin spoke on the increasing service of the organization to its members in the matter of data, trade regulations, and improvement of conditions which are proving a big benefit to both members and nonmembers.

Among the important trade practice rules adopted at the Louisville meeting this week was that designed to curb selling below cost. This rule, which was made part of the industries code, defines selling below cost as unfair trade practice and outlines the terms upon which cost must be computed. It reads as follows:

"The selling of batteries and battery parts below cost is unfair trade practice. In determining violations of this rule, the cost of the product shall be considered as the prime cost of material and labor, plus factory burden, plus selling, advertising, administrative, warehousing, transportation, collection and other general costs; plus taxes, depreciation, depletion and obsolescence, and plus normal and reasonable allowance for interest on the capital invested in the business, applicable to that division of the business or that product. Prime cost of material shall be understood to be purchase price or market, whichever is lower."

Other rules adopted at the conference here were:

Proposed rules to be disregarded: It was voted that of the proposed rules referred to the committee by the Cleveland conference, it be recommended to the Louisville conference that the following be disregarded:

(bb) "Inducing Breach of Contract." (d) "Secret Rebates." (e) "Price Discrimination." (f) "Commercial Bribery." (k) "False Invoicing." (l) "Price Lists and Terms of Sale." (m) "Contractural Obligations." (n) "Failure to Brand." (p) "Indiscriminate Quotations."

Proposed rules on "Consignment" and on "Special Inducements": The foregoing rules (j) and (o) among those referred to the committee were discussed and found to require further study. The chairman appointed Messrs. Wanvig, chairman; MacLean and Mowry as a subcommittee to make that study, including consignments, ledger balances, advance datings, terms, etc., and report their findings to the Louisville conference.

Rule C 1 and Guarantee Adjustment Policy. This rule was discussed in its relation to the N. B. M. A. standard guarantee and adjustment policy, particularly from the standpoint of (1) the recent trend toward extending the maximum adjustment period from eighteen to twenty-four months on specially insulated batteries, and (2) a proposal that the guarantee period be made flexible in accordance with certain stated conditions, and not remain fixed at three months. The chairman appointed Messrs. Mowry (chairman), MacLean and Wanvig as a sub-committee to study this question and report their findings to the Louisville conference.

Proposed Rules on "Misbranding," "Substitution of Quantity or Quality," "Deviation from Established Standards," and "Quality Changes." These proposed rules were referred to the chairman for formulation into a single rule to be recommended to the Louisville conference. The chairman has since reported that in his opinion the essence of the intent of these several proposals is sufficiently covered by adopted rule C 3, and recommends no further action.

Special Electrolyte Solutions and Compounds—The present development in the merchandising of "trick" electrolytes was discussed, the following resolutions were adopted and the chairman was instructed to send copies to all interested parties:

"Resolved, that, in order to protect the public against misrepresentation and deception, the attention of the Federal Trade Commission, the United States Bureau of Standards, the National Better Business Bureau and all other public authorities and fair trade enforcement bodies, should be, and hereby is, directed to the renewed activities of manufacturers and/ or distributors of substitute or special electrolytes or electrolyte compounds, for use in storage batteries where such electrolytes or compounds are misrepresented by claims that they are better than the standard battery electrolyte (dilute sulphuric acid, $H_2SO_4$) invariably used by all recognized battery manufacturers.

"Resolved, that any analyses and/ or tests of such electrolytes or compounds for publicity purposes should only be conducted under impartial auspices by competent chemists of recognized battery experience."

Rebuilt Batteries—The committee went on record as recognizing several factors as entering into the problem presented by rebuilt batteries, among the most important being (1) the sale of seconds by manufacturers of cases and other parts, and (2) the sale of used cases, covers, vent plugs and other battery parts to battery rebuilders by smelters, metal dealers, and battery wholesalers and dealers. Disapproval of such sales should be voiced by every battery manufacturer, and the committee recommends that the Louisville conference go on record as recommending the discontinuance of such sales on the grounds that they are detrimental to the industry and encourage unfair trade practices through the improper use to which such material is put.

Rule A1—Definition of Automotive Replacement Battery Manufacturer.—The term, Automotive Replacement Battery Manufacturer shall be understood to include only those concerns which manufacture their own grids, plates and small parts and market batteries under standardized and published specifications and price lists.

Rule B1—Cost System.—The installation of a proper and accurate method for determining costs, by each manufacturer is recommended by the industry.

Rule B2—Credit Information.—The distribution among members of the industry of information covering past due credit accounts, in so far as it may be done legally, is approved by the industry.

Rule B3—Arbitration.—The practice of handling disputes in a fair and reasonable manner, in a spirit of moderation and good will, of making every effort to arrive at an agreement by mutual agreement, and of arbitration under a prevailing code where agreement is not otherwise possible, is approved by the industry.

Rule C1—Fictitious Guarantees.—The giving or permitting to be given or published of a specific time or mileage guarantee of life, by warranty or guarantee policy, in excess of a reasonable life expectancy of the battery in average normal service; or the use of such terms as "unconditional guarantee" when conditions are in fact imposed on replacement, are condemned as unfair trade practices.

Rule C2—Transportation Allowances.—The making of transportation allowances in excess of the amount of the usual transportation cost, is condemned as an unfair trade practice.

Rule C3—Misrepresentation.—The making or causing or permitting to be made or published of any false, untrue or deceptive statements, by advertising or otherwise, concerning the grade, quality, quantity, substance, nature, origin, size or preparation of any batteries, component parts, electrolyte, or accessories is condemned as an unfair trade practice.

Rule D1—Rebuilt Batteries.—(a) The use of branded parts in connection with "rebuilt" batteries, where the plates are of a brand other than that shown on the branded parts, or (b) the branding and/or marketing of batteries as "rebuilt" when, in fact, all worn parts have not been replaced; or (c) the failure to mark and identify "rebuilt" batteries in such a manner as to clearly distinguish them from new batteries; are condemned as unfair trade practices.

# *Six Truck Sales Leaders for Feb., 1933*

Figures for March, 1933, will be found on Page 5.

| FEBRUARY, 1933 State | Sales | FIRST | | SECOND | | THIRD | | FOURTH | | FIFTH | | SIXTH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alabama | 127 | Chev | 84 | F-In | 18 | GMC | 3 | Reo | 2 | Au-D | 1 | | |
| Arizona | 34 | Chev | 17 | Ford | 10 | GMC | 4 | Int | 2 | Stude | 1 | | |
| Arkansas | 134 | Chev | 91 | Ford | 32 | Int | 7 | Dodge | 3 | Reo | 1 | | |
| California | 574 | Chev | 225 | Ford | 200 | D-S | 27 | Int | 24 | White | 14 | GMC | 13 |
| Colorado | 114 | Chev | 63 | Ford | 29 | GMC | 8 | Int | 6 | Stude | 4 | Dodge | 2 |
| Connecticut | 120 | Chev | 53 | Int | 22 | Ford | 16 | Dodge | 7 | Reo | 6 | G-Ro | 3 |
| Delaware | 39 | Chev | 28 | Ford | 7 | Int | 3 | | | | | | |
| Florida | 366 | Chev | 149 | Ford | 132 | Int | 41 | Austin | 27 | Dodge | 7 | Reo | 3 |
| Georgia | 23 | Chev | 9 | Ford | 5 | Int | 4 | * | 1 | | | | |
| Idaho | 19 | Chev | 7 | Ford | 6 | Int | 4 | Dodge | 2 | | | | |
| Illinois | 491 | Chev | 154 | Ford | 112 | Int | 78 | DT | 38 | White | 20 | Reo | 14 |
| Indiana | 275 | Chev | 134 | Ford | 58 | Int | 37 | Dodge | 15 | G-I | 7 | Stude | 4 |
| Iowa | 207 | Chev | 105 | Int | 39 | Ford | 37 | Dodge | 10 | DT | 6 | GMC | 4 |
| Kansas | 151 | Chev | 93 | Ford | 37 | Int | 10 | DT-D | 3 | Stude | 2 | M-R | 1 |
| Kentucky | 227 | Chev | 95 | Ford | 40 | Int | 37 | Stude | 26 | D-G | 8 | Indiana | 4 |
| Louisiana | 109 | Chev | 49 | Int | 27 | Ford | 15 | Austin | 9 | Dodge | 3 | * | 1 |
| Maine | 83 | Chev | 49 | Ford | 20 | Int | 7 | GMC | 3 | DT | 2 | R-Ro | 1 |
| Maryland | 190 | Chev | 106 | Ford | 33 | Int | 20 | White | 6 | GMC | 4 | Dodge | 3 |
| Massachusetts | 304 | Chev | 173 | Ford | 37 | Int | 24 | D-R | 12 | GMC | 11 | Stude | 7 |
| Michigan | 299 | Chev | 151 | Ford | 63 | Dodge | 22 | Int | 18 | G-Wi | 10 | Reo | 9 |
| Minnesota | 203 | Chev | 118 | F-In | 28 | Reo | 6 | DT | 5 | Federal | 4 | Stude | 3 |
| Mississippi | 91 | Chev | 62 | Int | 12 | Ford | 10 | Indiana | 2 | Au-Fe-G | 1 | | |
| Missouri | 555 | Chev | 299 | Ford | 99 | Int | 60 | Dodge | 25 | DT | 18 | Fe-W | 9 |
| Montana | 9 | Chev | 4 | Ford | 3 | In-W | 1 | | | | | | |
| Nebraska | 58 | Chev | 31 | Ford | 12 | Int | 8 | DT | 2 | G-I-R | 1 | | |
| Nevada | 16 | Chev | 6 | Ford | 5 | G-S | 2 | Dodge | 1 | | | | |
| New Hampshire | 49 | Chev | 27 | Ford | 11 | Int | 7 | * | 1 | | | | |
| New Jersey | 363 | Chev | 152 | Ford | 72 | Int | 52 | Dodge | 30 | GMC | 15 | DT | 8 |
| New Mexico | 37 | Chev | 18 | Ford | 10 | Int | 9 | Dodge | 15 | Reo | 10 | GMC | 9 |
| New York | 1196 | Chev | 455 | Ford | 213 | Int | 175 | GMC | 89 | Dodge | 43 | DT | 37 |
| North Carolina | 230 | Chev | 138 | Ford | 58 | Int | 17 | DT-D-G | 3 | Au-I-R | 1 | | |
| North Dakota | 13 | Ford | 5 | Chev | 4 | Int | 3 | Reo | 1 | | | | |
| Ohio | 419 | Chev | 197 | Ford | 115 | Int | 40 | Dodge | 15 | Reo | 10 | GMC | 9 |
| Oregon | 55 | Chev | 25 | Ford | 19 | Int | 8 | Dodge | 2 | Federal | 1 | | |
| Pennsylvania | 818 | Chev | 325 | Ford | 230 | Int | 101 | Dodge | 43 | GMC | 16 | Stude | 13 |
| Rhode Island | 39 | Chev | 17 | Ford | 6 | Reo | 5 | I-In | 3 | GMC | 2 | M-P-Ro | 1 |
| South Carolina | 76 | Chev | 39 | Ford | 28 | Int | 5 | Austin | 2 | D-G | 1 | | |
| South Dakota | 36 | Chev | 15 | Ford | 14 | Int | 5 | DT-S | 1 | | | | |
| Tennessee | 111 | Chev | 59 | Ford | 20 | Int | 14 | Federal | 4 | Au-G-I | 3 | Dodge | 2 |
| Texas | 441 | Chev | 266 | Ford | 84 | Int | 53 | GMC | 11 | Dodge | 7 | R-W | 3 |
| Utah | 32 | Chev | 19 | Ford | 6 | Int | 5 | Dodge | 2 | | | | |
| Vermont | 36 | Chev | 19 | Int | 6 | DT | 5 | Ford | 3 | D-I-R | 1 | | |
| Virginia | 252 | Chev | 143 | Ford | 60 | Int | 21 | Dodge | 10 | GMC | 5 | DT | 4 |
| Washington | 81 | Chev | 42 | Ford | 23 | Int | 4 | A-D-G-S | 2 | DT-R | 1 | | |
| West Virginia | 102 | Chev | 53 | Ford | 19 | Int | 11 | Dodge | 7 | G-R | 4 | I-St | 1 |
| Wisconsin | 166 | Chev | 73 | Ford | 45 | Int | 22 | DT-D | 6 | G-S | 4 | Sterling | 2 |
| Wyoming | 39 | Chev | 21 | Ford | 14 | Int | 3 | Dodge | 1 | | | | |
| District of Col. | 59 | Chev | 24 | Ford | 13 | Austin | 6 | G-In | 4 | Mack | 3 | * | 1 |

**KEY TO ABBREVIATIONS AND SYMBOLS**

A—Autocar; Au—Austin; B—Brockway; C—Chevrolet; D—Dodge; DT—Diamond T; F—Ford; Fe—Federal; G—GMC; I-Indiana; In—International; LFR—La France-Republic; M—Mack; P—Pierce-Arrow; R—Reo; Ro—Rockne; S—Studebaker; St—Stewart; W—White; Wi—Willys.